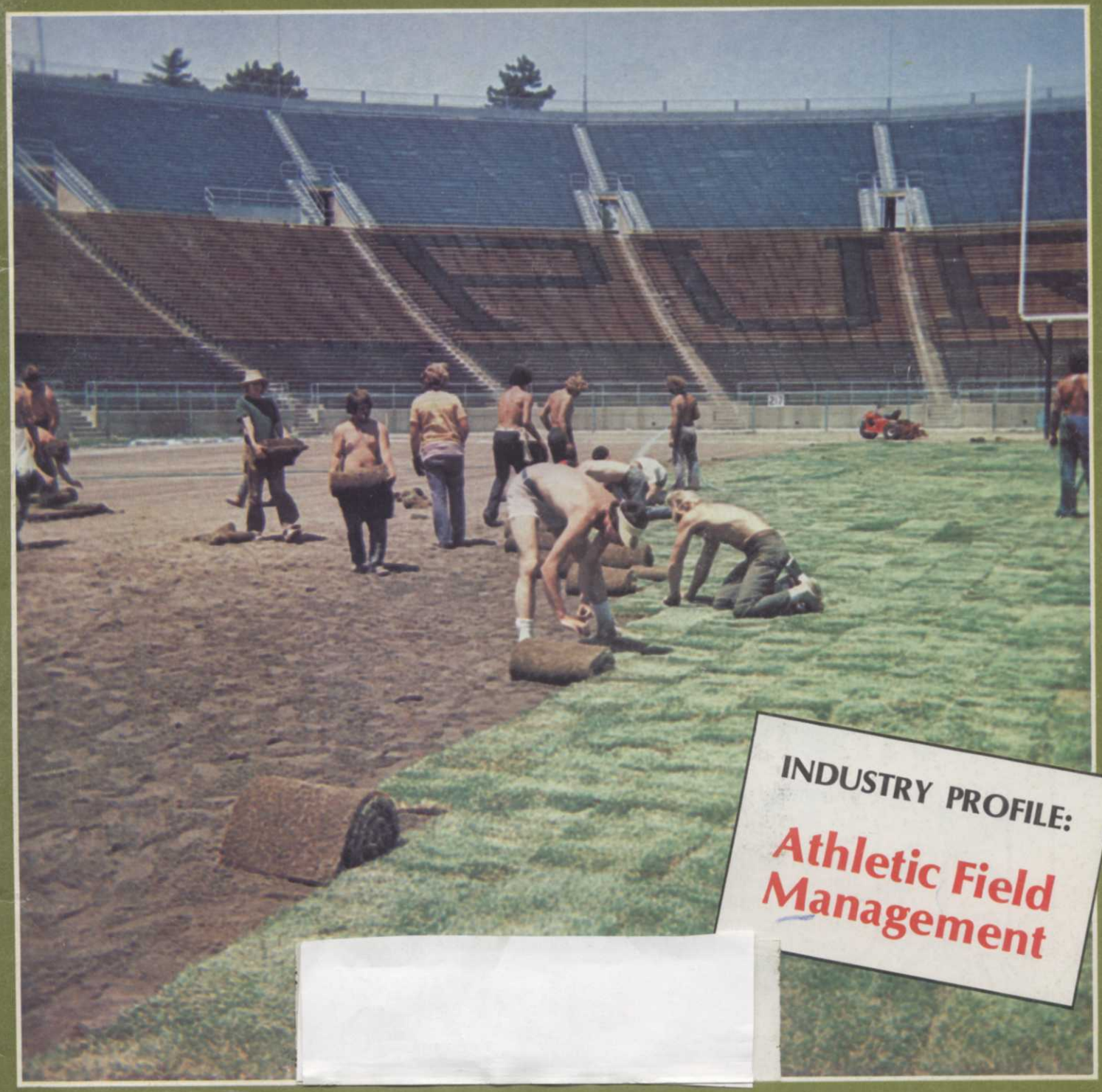
The Business Journal of Vegetation Management July 1978/$1.25

WEEDS TREES & TURF

Make Way for Diesels

The Landscape Contractor/Architect Relationship

Financing the New Business



INDUSTRY PROFILE:

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Roundup®. There's no better grooming aid for unruly turf.

Roundup® belongs in your turf renovation program.

Renovation of a weedy fairway, sod farm or other grassy area used to be a laborious and time-consuming chore, but not any more.

Not with Roundup® herbicide by Monsanto. Because one application of Roundup will control many annual and perennial weeds, yet allow you to proceed with tillage and planting operations as soon as seven days later.

Roundup also makes sense wherever treatments for grounds maintenance are called for. One man with Roundup in a backpack sprayer can replace many of the herbicides and frequent repeat treatments that are often necessary.

Roundup has no residual soil activity.

That's why you can go in seven days later and re-plant. Roundup won't wash, leach or volatize from the treated area to injure desirable vegetation. Naturally, normal precautions should be observed to avoid spray drift.

Roundup gets to the root of the problem.

Including many of your toughest vegetation problems, like: bluegrass, bermudagrass, quackgrass, bindweed, johnsongrass, fescue and vaseygrass.

Can you afford to let another season go by without Roundup in your turf renovation and grounds maintenance programs? Your local chemical dealer is the one to see for your supply of Roundup herbicide.

"Translocation" is the key.

Roundup is applied to the weed foliage, absorbed through the leaf surface, and "translocated" throughout the entire plant. In this way, Roundup destroys the entire weed, including the roots or rhizomes.

There's never been a herbicide like this before.

Monsanto

ALWAYS READ AND CAREFULLY FOLLOW THE LABEL DIRECTIONS FOR ROUNDUP HERBICIDE.

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R178-04

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What can a hole in the ground do?

When your grounds become hard-packed from constant use and temperature changes, or if the ground is naturally hard, grass has a tough time growing.

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These holes allow air, water and fertilizer to penetrate to the root zone where they're needed. They relieve compaction, giving grass room to grow. New, more drought-resistant roots are stimulated. And the turf takes on a springy, soft feel.

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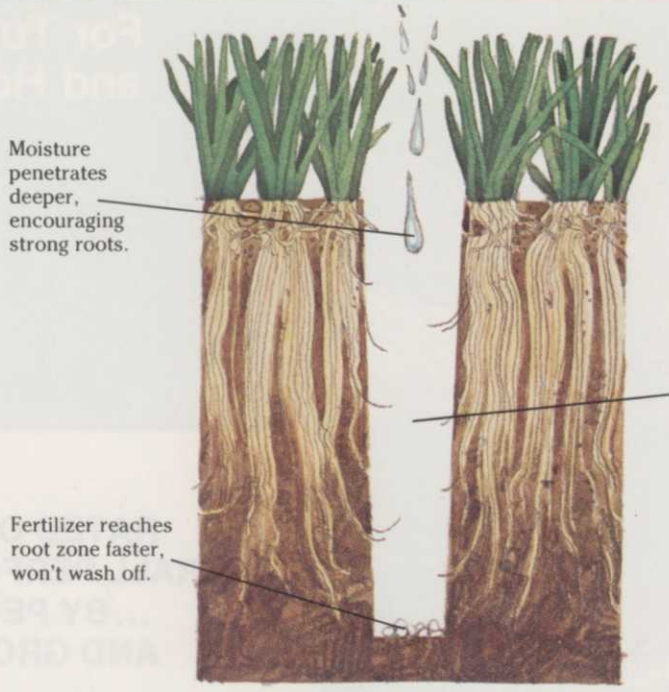
The Ryan Renovaire® is designed to contour aerate compacted turf on hilly as well as flat areas. Its 12 tine wheels are mounted in pairs, operating independently to give both high and low spots equal penetration.



The Ryan Tracaire® is used to aerate large level areas, especially athletic fields. Mounted by a 3-point hitch, it gets the job done quickly, easily, efficiently.

Both the Renovaire and the Tracaire can be equipped with coring, slicing or open spoon tines for aerating all types of soil in all seasons. Both can be used with a 12-foot-wide dragmat to break-up cores and groom the grass. And both are built to last, like all Ryan equipment.

Give your large turf areas room to breathe with the Ryan Renovaire and Tracaire aerators. You'll see the green, healthy difference a few simple holes can make.

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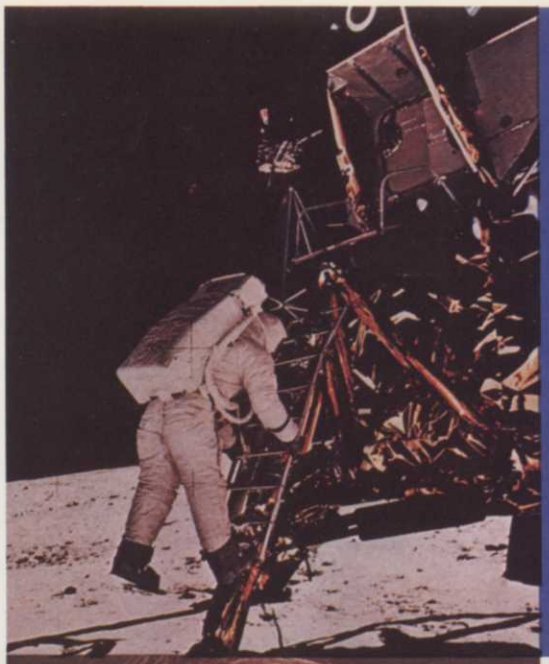

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Other International Inquiries: **Northrup King Co., Minneapolis, Minn. 55413**

WT&T

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The Standard.

Turf playability: it's your responsibility. When it's right, you know it. When it's wrong, everyone seems to know it. When a piece of you is on the line, you don't want to leave anything to chance. You want the dependability of proven programs and products: products that set the standard by which others are often compared—products like Acti-dione® turf fungicides. They've set an industry standard during their more than 20 years of continuous use without evidence of fungus resistance. And today, Acti-dione acceptance continues to grow. That's got to be proof of reliability. Shouldn't you, too, join the growing rank of professionals who rely on the standard, Acti-dione turf fungicides?

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VIEWPOINT

Bruce F. Shank, Editor

When we decided last summer to explore the various markets of the Green Industry and publish our findings this year, we didn't realize the significance of what the profiles might uncover. We do now.

We stumbled upon areas of great potential, such as design/build in landscaping, revegetation in mine reclamation, interior landscaping, hydraulic seeding and mulching for erosion control, lawn care, and containerization in the nursery industry.

This month we report on the area of athletic field management. I am amazed at how many people are involved in the field and at the potential that exists, if they were only organized.

Grounds managers for parks are organized to a degree. As Dr. Roy Goss of Washington State University pointed out in the Letters section of the May issue, park administrators are relatively organized, but maintenance supervisors are not. Goss encouraged maintenance supervisors of parks to get organized and ask for help. It's there for the asking.

Public school and municipal managers of grounds appear even less organized. They have not convinced taxpayers of the need for proper maintenance of turf areas. Or perhaps more accurately, they have not sold the school boards and government councils that money should be spent for care of grounds other than mowing.

These government bodies can be sold. Contra Costa Landscaping Inc. in Martinez, Ca., has proven it (see profile in April issue). Ken Gerlack at Contra Costa first studies the individual school district for the proper contact, and then approaches that contact with evidence that proper grounds care goes beyond mowing.

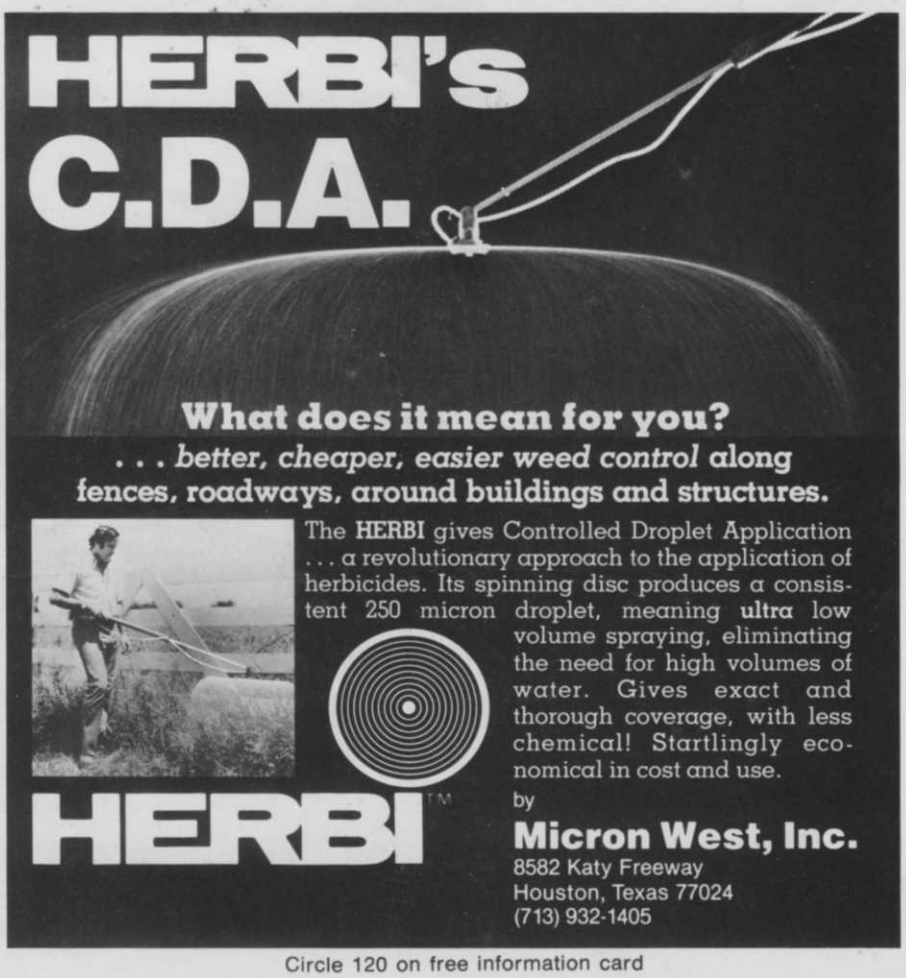
For small school districts, a maintenance contract with a reputable contractor will provide the best results for the money spent. For larger districts, one individual trained in agronomy should be placed in charge of maintenance for the whole system. Leaving the care of acres of public real estate up to the janitorial staff or to a seasonal physical education teacher makes no sense to me.

Often, the decision making of turf care is given to a committee that meets once a month. Their decision is carried out by individuals basically untrained in turf care.

There is a strong case here for organization of individuals trained in turf care to manage the millions of acres of public grounds in the U.S. School districts should structure their maintenance programs such that one person can keep abreast with the latest technology in turf care and implement it for the public good.

These individuals should organize an association just for their needs and compile technical information to be used. It's easy to say but hard to do, right?

Nevertheless, Weeds Trees & Turf is going to make an attempt to locate skilled turf managers in public positions and encourage them to organize. We will also try to serve their needs better with technical information and industry data. We want to support them in their efforts to obtain adequate budgets for turf care of public grounds. **WTT**



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KUBOTA L185

How to buy the right tractor.

It's easy to buy a tractor. You go to a dealer. Pay him some money. He gives you a tractor.

Buying the right tractor is another matter. It's not hard to do. But there are a couple of important things to keep in mind.

YOU DON'T EAT SOUP WITH A FORK.

And you don't need a 100 horsepower tractor to raise vegetables, move some dirt on your farm, or landscape your yard. The prime consideration in buying your tractor is to get the right one for the job you have to do.

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We are the world's leading manufacturer of mid-size tractors. In fact, that's all we make. We don't make giant tractors. Nor do we make garden toys. Kubotas are just right for your lesser jobs that still require the power and versatility of a real tractor. So even if you already own a 400 acre spread and a couple of heavyweight tractors, you probably still have a place for a mid-size Kubota.

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If you don't want to lavish a lot of attention on your tractor, Kubota's a good one for you. All Kubotas have water-cooled diesel engines. Diesel engines have no electric ignition system, and they never require a tune-up. This means service is reduced to a bare minimum. Which brings us to another of our strong suits. Economy.

HOW TO SAVE MONEY.

Running a Kubota diesel engine costs a lot less than what it would cost to run a comparable gasoline engine. And a 12 to 47.5 horsepower Kubota is going to burn up a lot less fuel than a larger machine.

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Kubota L-185 tractor (17 h.p.) shown with mid-mount mower.

GREEN INDUSTRY NEWS

TREES

EPA officials observe tree spraying by NAA

Bob Felix discusses the spray rig and safety equipment as EPA officials watch and listen.

Approximately 15 state and Federal pesticide enforcement officials gathered in June near Washington, D.C., to watch members of the National Arborist Association demonstrate tree spraying. The purpose of the demonstration was to provide enforcement officials with an opportunity to observe all the details of the application of pesticides to shade trees, ornamentals, evergreens and shrubs.

As Robert Felix, NAA executive director, narrated, a crew from Guardian Tree Experts of Rockville, MD, demonstrated tree and ornamental spraying using water only. Earl J. Sinnamon of Swingle, Inc., Denver, CO, chaired the committee which arranged the demonstration. Walter Money and Charles Cissel of Guardian helped set up the meeting.

The enforcement officials seemed concerned primarily about drift and protective clothing on applicators. However, experience with EPA inspections has shown the greatest interest in the tank mixture.

One interesting twist brought out was the effect of pollution alerts on tree spraying. Maryland law requires that tree spraying stop during an inversion and resulting pollution alert. Not only can air pollution harm some trees, but it also can make care of trees impossible under alert conditions.

Following the demonstration attendants asked questions and discussed misunderstandings at a luncheon at a nearby country club.

The demonstration was the first of its kind by arborists for EPA officials.

ORNAMENTALS

Soil pasteurization is cheaper alternative

Dr. David Rosberg of Texas A & M University has developed a cheaper type of soil sterilization called pasteurization. The process can cut the cost of sterilizing soil by 75 percent.

The current method of sterilization involves 212-degree steam heat which requires large amounts of energy. Soil fumigants are also used to sterilize soil.

Rosberg's method uses aerated steam to produce a temperature of 150 degrees for 30 minutes, with only ten minutes of steam.

The system uses a drum type mixer. Beneficial microflora are not destroyed by the process unlike the higher temperature method. Rosberg says the beneficial organisms compete with plant pathogens that colonize soil mixes and cause root disease.

GOLF

Use of wastewater subject of survey

The American Society of Golf Course Architects Foundation, the National Golf Foundation, and the United States Golf Association are jointly involved in a survey to determine the status of the use of recycled water (effluent and other waste water) on golf courses.

Data received will be placed in a central data bank. The groups have promised complete confidence in information obtained through the questionnaires mailed recently.

A conference has been planned in Chicago, Nov. 13-14 to discuss the results.

TOUCHDOWN
Kentucky bluegrass

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Fast start! Tough turf! Disease resistance!

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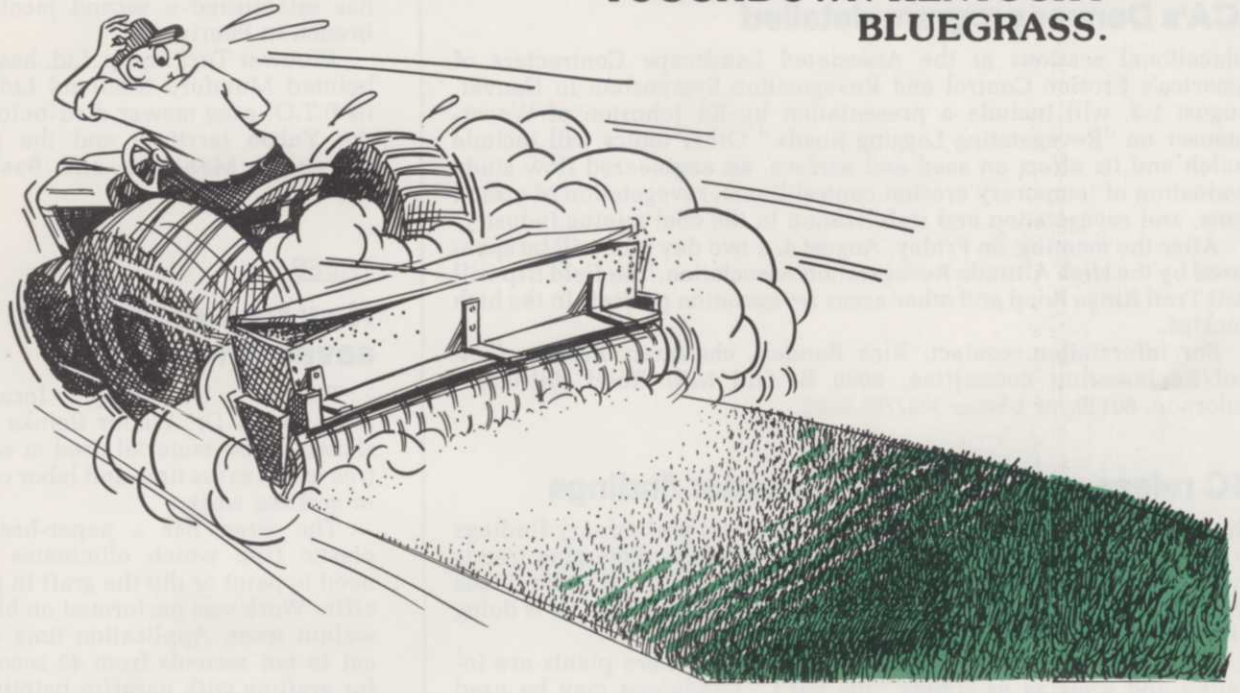

Fast starting Touchdown soon shows its color — germinating quickly and rapidly developing into mature, healthy plants. Early cover means fewer washouts or blowouts. Touchdown puts its growth where you want it — into rhizomes and roots — not all vertical leaf and stem.

Touchdown's benefits don't end there. It quickly produces a saleable quality turf. Turf with less waste and loss. Turf that's readily adaptable to modern, automated harvesting equipment.

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Landscape Contractor News

OSU offers MA in landscape architecture

Ohio State University in Columbus, will offer a master's degree in landscape architecture, beginning with the coming Autumn quarter. OSU will be one of only 19 schools in North America offering such. Their program will focus on environmental planning. This differs from most schools, which tend to focus on environmental analysis. The new graduate program at OSU will also train students to produce designs. The undergraduate degree only prepares students to help implement designs.

While 200 master's degrees are awarded annually in landscape architecture in the U.S., job opportunities exceed the supply of graduates by at least 50 percent, according to a recent OSU bulletin.

ALCA's Denver program detailed

Educational sessions at the Associated Landscape Contractors of America's Erosion Control and Revegetation Symposium in Denver, August 1-3, will include a presentation by Ed Johnston of Weyerhaeuser on "Revegetating Logging Roads." Other topics will include mulch and its effect on seed and surface, an engineered flow study evaluation of temporary erosion control liners, revegetation of a sand dune, and revegetation and stabilization in the coal mining industry.

After the meeting, on Friday, August 4, a two day tour will be sponsored by the High Altitude Revegetation Association. The field trip will visit Trail Ridge Road and other areas revegetation projects in the high Rockies.

For information, contact: Rick Randall, chairman, Erosion Control/Reclamation committee, 6000 S. Old Mill Road, Littleton, Colorado, 80120; or phone 303/795-2582.

NMC releases preliminary consumer findings

The Nursery Marketing Council has released its preliminary findings in an intensive study of the nursery marketplace. Emerging trends show that, in the minds of the typical consumers in the initial focus groups, a "nurseryman" is a businessman who knows what he is doing with living plants, no matter what his specific role.

The homeowner tends to think of the place where plants are installed and growing as simply "the yard." Landscape may be used where there has been some attempt at formal planning and planting. "Garden" seems to mean the place where flowers or vegetables are growing and "lawn" is where the grass is.

Major buying motivation seems to be "appearance" or "beauty." Adding dollar value to the home received more attention than was earlier predicted by some observers. Another possible buying factor is "therapy." As one research analyst put it, "Working with plants lets them relax, get their minds off problems, releases their anger, lets them take out their agressions by weeding, digging, etc."

Union landscape laborers wages rise

Wages for union landscape labor in Southern California has risen from $7.95 an hour to $8.65 an hour as of July 1. Of the 70¢ increase, 40¢ goes directly to workers in increased wages. The remaining 30¢ goes into vacation and health and welfare benefits. These increases affect union contractors signatory to agreements with the Southern California District Council of Laborers, which holds jurisdiction in 12 of the 13 Southern California counties. In San Diego, a total package wage increase of 40¢ per hour was scheduled, increasing laborers' wages from $11.75 an hour to $12.15 an hour.

COMPANY NOTES

Branches added, moves announced

The Kioritz Corp. of America has changed its name to Echo, Inc., and moved into new quarters in Northbrook, Ill.

Jacobsen Mfg. Co. has expanded its production facilities in Brookhaven, Miss., and named Turf-Aid of Billings, Mont., a distributor of turf maintenance products. Little Wheels Turf & Equip. Inc. of Iowa City, Ia., has established a second Jacobsen branch in Peoria, Ill.

Brouwer Turf Equip. Ltd. has appointed Mumford Medland Ltd. as its P.T.O. gang mower distributor in the Yukon territory and the provinces of Manitoba and Saskatchewan.

TREES

New tree wrap saves time, labor

Purdue University forestry research by Dr. Walter Beinke has shown a new material used to wrap tree grafts saves time and labor costs in grafting work.

The wrap has a paper-backed plastic film which eliminates the need to paint or dip the graft in paraffin. Work was performed on black walnut trees. Application time was cut to ten seconds from 40 seconds for grafting with paraffin painting.

A check for $1,500 to begin a special fund for creation of a playground for the developmentally disabled in Salem, Oregon, is presented to Paul Koch (right), Salem recreational director, by Don Hector and Francine Liming of the Manhattan Ryegrass Growers Association. The Growers will also plant the grass for the park at no cost.

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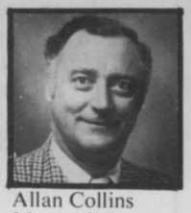

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GOVERNMENT UPDATE

Door closed on warrantless inspections

The U.S. Supreme Court ruled in June that Occupational Safety and Health Administration enforcement officials can be denied entry into a business if they lack a search warrant.

In a case which may set precedent over other types of inspections by government agencies, such as the Environmental Protection Agency, the high court called warrantless inspections unconstitutional as a violation of the Fourth Amendment.

Meanwhile, an EPA regional judicial officer in San Francisco required EPA inspectors to have warrants for searches to pest control operators and issue first-time warnings to label violators. The EPA case involves a fuzzy distinction between applicators and distributors, where distributors are subject to inspection and applicators are not.

Amendments to the Federal Insecticide, Fungicide and Rodenticide Act have been in conference committee for months. Part of the holdup is wording which is meant to clarify the distributor/applicator status of pest control companies.

Labor reform act bogged down

Opponents of the Labor Reform Act have extended debate to block passage of the law until major changes can be made. Votes to stop debate take place daily, but fail by less than five votes. If cloture is obtained, more than 600 amendments to the bill have been prepared to slow down passage. The bill would make union organization of small businesses considerably easier than at present.

Fifth of restricted use products face cancellation

More than 300 of 1,600 restricted use products face cancellation because registrants have failed to file amended registrations or request hearings. EPA officials say the cancellation will not have a significant effect upon users because products identical to those in trouble are in compliance.

Conditional registration rules await FIFRA

Final conditional registration regulations will not be issued until the FIFRA bill is passed according to EPA officials. Regulations will ease registration of products identical or substantially similar to registered products or for new uses to registered products. However, such rules include aspects such as data compensation and elimination of redundant safety test data.

Illegal aliens subject of Senate action

U.S. Senate Bill 2252 now before the Judiciary Committee would fine employers up to $1,000 for knowingly hiring an illegal alien. The law will require suitable identification documents so employers can determine the status of alien applicants. The Chamber of Commerce backs the bill saying illegal aliens deprive residents of jobs and opportunities.

RECLAMATION

Idaho foresters get revegetation results

University of Idaho forest management researchers have been studying an area in northern Idaho since 1972 to determine which species and planting methods can be used most successfully to revegetate the slopes and stream channels which have been damaged by mining and refining operations for almost a century.

"The results from the project have been very encouraging," says Roger Gordon, one of two research associates assigned to the project. "Certain species, including container-grown Ponderosa pine, Austrian pine and hawthorn, have had a high rate of survival in many test plots, and the mining companies have been able to use our findings to develop long-range revegetation plans for their lands."

TURF

Scotts gains label for Ataenius control

The Proturf Division of O. M. Scott & Sons has announced its Nematicide/Insecticide has received national registration for control of *Ataenius spretulus* larvae.

The product is applied as a granule which is watered into the turf rootzone after application. The active ingredient is ethoprop. It is not for use on bentgrasses, fine fescues, or ryegrasses.

AQUATICS

Tilapia fish has dual benefit

The *Tilapia*, a tropical fish originally from E. Africa, was successfully introduced into the United States in the 1950's as a control agent for weeds in irrigation canals in Southern California. Now, pending research, the fish may also become a harvestable resource.

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PEOPLE

New officers and directors for the American Society of Consulting Arborists, elected at their annual meeting in February, are: (left to right) President Elect **Jack Schultz,** New York; Immediate Past President **William Lanphear,** Ohio; President **F. L. Dinsmore,** Missouri; Director **Henry Carroll,** Maryland; Vice President **John Duling,** Indiana; Executive Director **Spencer Davis,** New Jersey; Director **Jack Kimmel,** Ontario, Canada; and Secretary Treasurer **William Griffin,** California. Directors **William Rae,** Massachusetts and **William Owen,** Oregon, were absent at the time of the photograph.

Dr. Bernard J. Bienvenu, Professor and Head of the Department of Management and Administrative Studies at the University of Southwestern Louisiana, will give the Keynote Address at the 103rd Annual Convention & Trade Show of the American Association of Nurserymen, July 15-19, at the Fairmont Hotel in New Orleans. His address will take place at the Keynote Luncheon on Monday, July 17. At the same time, the Garden Communicator's, Norman Jay Colman, and L. C. Chadwick Educator's awards will be presented.

Dr. Bienvenu is author of the book, *New Priorities in Training — A Guide for Industry,* and has contributed to eight other books. His articles have appeared in many business magazines and journals. He has conducted management development seminars for business and government employees here and around the world. He recently conducted such a program for high officials of the government of Haiti under the sponsorship of the U.S. State Department and the International Management Development Institute, of which he is a member.

Dr. Reed Funk, Turfgrass Breeding, Rutgers University, recently received a plaque of appreciation and a hearty commendation from Doyle Jacklin, elected president of the Lawn Institute. Dr. Funk is the originator of many of America's modern turfgrass cultivars. Jacklin noted (speaking to Funk), "A primary factor in the Lawn Institute's successful program of public education and encouragement of lawn efficiency has been availability of today's superior turfgrass varieties. Many have been originated by you and your students under the outstanding breeding program at Rutgers. This token is in deep appreciation of your leadership and excellence of research."

This is only the second award of merit ever given by the Lawn Institute, the first have gone to George Osburn of Hercules Chemical, recently deceased. Osburn, a past president of the Lawn Institute, was prominent in fostering the "gradual-release" concept of turf fertilization.

Lawn Institute headquarters is in Marysville, Ohio under the direction of Dr. Robert W. Schery.

Quentin Nakagawara, a horticultural instructor at Butte College in Oroville, California, is the 1978 recipient of the Bert Kallman Award, presented by the California Association of Nurserymen and the Kallman family for outstanding achievements and contributions to horticulture.

Nakagawara received the award from Gary Hartman, CAN president, during the association's annual Refresher Course in San Luis Obispo.

A specialist in ornamental horticulture, Nakagawara has been associated with Butte College since 1969.

These officers were elected by the New York State Nurserymen's Association at their annual meeting: (left to right) Director-at-Large **George Schnichtel;** 2nd Vice President **Jack Lander;** 1st Vice-President **Henry Well;** President **Alfred Krautter;** and Treasurer **Arthur H. Steffen.** Secretary **Frank Ferraro** was not present for the picture.

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HOW TO IMPROVE THE LANDSCAPE CONTRACTOR/ARCHITECT RELATIONSHIP

"The Contractor walks on the job site with his back already against the wall. There is no way to come out a winner unless you gamble." Carpenter.

Incorporation of natural materials in site construction is growing on both commercial and residential levels. Both landscape contractors and landscape architects are experiencing increased demand for creative and well-constructed landscapes. Meeting this demand calls for the best possible relationship between the contractor and the architect.

To get to the bottom of the lingering anxiety between the contractor and architect, Weeds Trees & Turf interviewed a number of principles in both fields. We also tried to measure the importance of the design/build firm in the U.S.

The relationship between the landscape contractor and landscape architect has improved in the past five years because of rethinking of old attitudes by landscape architects and the overall improvement in the quality of landscape contractors. However, the position of the contractor in the construction process is seen as the primary cause of dissension, and this does not appear likely to change.

The Associated Landscape Contractors of America (ALCA) and the American Society of Landscape Architects (ASLA) are working together to resolve the things that can be changed.

Low Bid Process

"The low bid process immediately puts the contractor in an adversarial position," says Jot Carpenter, chairman of the Ohio State University Department of Landscape Architecture and president-elect of ASLA. "The contractor walks on the job site with his back already against the wall. There is no way to come out a winner in the bidding process unless you gamble. There is no way to disqualify poor contractors who submit unrealistically low bids."

Richard Brickman, president of the design/build firm Theodore Brickman & Assoc. in Chicago and past president of ALCA, views bidding in this way: "The person doing the design is trying to get the maximum amount of impact for the budget he has. The contractor doing the implementation is trying to get the maximum amount of profit from the job with a fixed budget based on the lowest bid. You can see the conflict."

Ways to improve the low bid process required in public work and often in private work, are registration of qualified contractors, changing the bidding process, the performance bond, and pre-bid conferences.

Very few states have licensing programs for landscape contractors, although 38 states have some type of registration for landscape architects.

California has required licensing of landscape contractors for nearly 30 years. Mike Leeson, executive director of the California Landscape Contractors Association, says licensing is ineffective because the courts can't keep up with the number of complaints and public agencies ignore requirements that bidders be licensed. "Court cases against unlicensed operators haven't been too successful, "Leeson states. "Fines are small. It is cheaper to pay the fine than to take the examination and pay the fee to become licensed. Actually, I think the licensed person is at a disadvantage because the state isn't enforcing the law."

"The association could do a better job than the state of enforcing a certification program, a better job of examining, and a better job of protecting the public," Leeson claims.

Carpenter uses a system in private work where the low and high bids are thrown out, the remainder are averaged, and the bid closest to the average is accepted. "Perhaps successful use of this practice in private work could set a standard for public work."

"We separate the men from the boys with our bonding procedures," says Lane Marshall, president of Lane Marshall & Assoc. in Sarasota, Fla., and current president of ASLA. "Bonding is required in all public work and most significant private work. If the work is limited to installing plant material, I don't have strong feelings about registration. If installing walks and patios is involved, then a building contractor's license is required in Florida."

Too often contractors bid from incomplete or inadequate specifications. Consequently, estimates made by the contractor before bidding may be too low to make a profit. Prebid conferences between the landscape architect and the landscape contractors involved in the bidding allow for clarification of specifications and permit changes or addenda.

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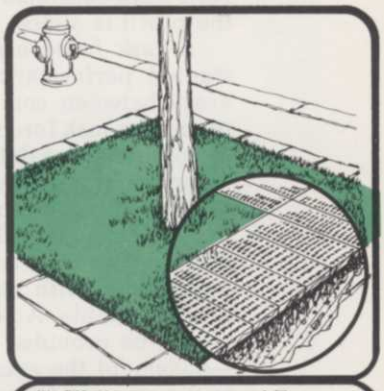

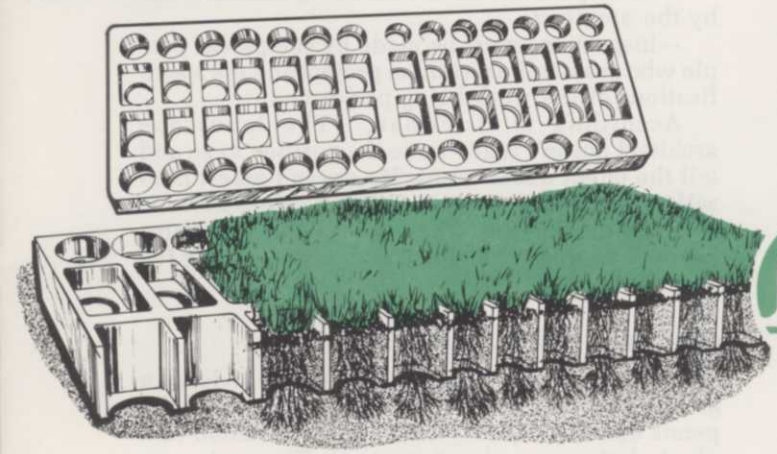

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"By negotiating with the landscape contractor the architect can eliminate details that serve no functional benefit, "Brickman says. "Too often we don't hear anything from the contractor until he is actually out there working," states William A. Behnke, president of William A. Behnke Assoc. in Cleveland, Ohio, and vice president of ASLA. At that time it is extremely difficult if not impossible to get an addendum.

Performance Delay

Two time factors work against the landscape contractor. The first is the delay of a year or more between bid acceptance and actual performance. Not only does this make estimating costs difficult, it ties up performance bonds for the period of the delay, which is longest for the contractor since he is the last to finish.

"By the time the contractor walks on the job, costs have escalated beyond the contract price and the profit is almost gone," Carpenter points out.

A task force organized by ALCA and ASLA studied performance delays and other problem areas between contractors and architects. In the report the task force recommended these methods of counteracting delays:

—contact the growers of plant materials immediately after contract award, and periodically during any delay period. Issue purchase orders immediately after contract award.

—negotiate with growers for contract growing where possible. A performance bond or insurance should be provided by the grower.

—document the cause of any delays in a letter to the owner with price increases.

—discuss partial prepayment for plant materials and storage locations with the architect and owner.

—if a retainer is held, there should be time limitations and provisions to accrue interest.

The second time factor working against the landscape contractor is the rush for completion. The contractor is on the tail end of a project and everyone is waiting to get their retainers back.

Furthermore, completion is hampered by clean-up and poor site preparation by excavators responsible for grading. These are tasks often put on the contractor but not mentioned during the bidding process. Not only do they slow the contractor down but they increase his costs and reduce his profit.

Often the contractor is pressured to install plants out of season. This complicates guarantees.

"To avoid unexpected jobs the contractor should convince the client and the architect that the landscaping should be a separate contract," Carpenter says.

"This forces the general contractor to finish his work and clean-up so he can get paid."

"The contractor often has to take care of other people's problems," Behnke states. "For instance, if there's a trench that sunk and the landscaping is already in, it's not his fault the trench sunk. It was the general contractor that trenched that. The site contractor is not going to go back to the plumbing contractor because he'll have to bring him back on the job. He is going to try to get the landscaper to handle it."

Robert Thomas, partner in Behnke Assoc., mentions problems with turf, "If the topsoil isn't respread to specifications by the site contractor and the grass planted by the landscape contractor fails, usually the landscape contractor is expected to do the work over under his guarantee."

Inspection by Architects

Smooth implementation of landscape specifications can be helped by periodic inspection by the architect. The prebid conference may clarify some points, but inspection by the architect during planting phases reduces the chance of rejection of the job by the site contractor.

"Inspection procedures are not clearly enough defined to protect the architect, contractor and owner from improper bidding or execution by unscrupulous operators." Task Force.

The ALCA/ASLA task force describes the role of the architect during implementation as inspecting the quantity, quality, storage, handling, planting and maintenance of plants.

The task force said the contractor should request prompt inspection on completion of each phase of the work. The landscape architect should be prompt in his inspection and notify all parties concerned so corrective action can be taken.

"Inspection procedures generally are not clearly enough defined so as to protect the architect, contractor and owner from improper bidding or execution by unscrupulous operators."

The task force made these recommendations to help solve the problem:

—inspection procedures should be spelled out at prebid and preconstruction conferences.

—an inspection cost should be figured into bids by the architect.

—inspections must be made by competent people who are familiar with the project and the specifications of the work being performed.

According to Brickman, "The landscape architect doesn't really have the position to go and tell the client about terms. He doesn't assert himself in the bidding process. When it comes down to supervising the job when his talents are most needed, he doesn't have enough money in the fee to go to the site."

Guarantees and Maintenance

Guarantees are often required for at least a growing season. But survival of plant material depends upon the quality of the plant, location of a plant, drainage, and maintenance. The contractor

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may have only limited control over any of these factors.

These factors should be discussed at prebid conferences and worked out prior to contract.

If maintenance is to be performed by the contractor it should be under a separate contract.

In the case of lawns, the architect should inspect grading of topsoil, drainage, and test the soil prior to the contractor's installation. Results should be documented to the client and adjustments recommended before the contractor starts working.

Guarantees should not be given without some control over maintenance. If the client is going to do his own maintenance, his program should be checked and documented. Proof of maintenance should be required if any claim to the guarantee is made.

Installation of grass or other plant material should not be done out of season when chance of survival is low. Proper timing of installation should be discussed at prebid conferences and included in specifications.

The Landscape Architect

The basic point to remember about the landscape architect is that he sees the project as more than individual plants. He sees it as a total impact of plants, walls, sidewalks, fences, and contouring. He must take into consideration drainage, utilities, irrigation, traffic, textures, and parking. Often he will consult an arborist, horticulturist or contractor about plant selection and use.

The landscape architect takes all these points and puts them into a graphic plan and a list of specifications. His responsibility is the total package. His package must fit in with the package of the building architect too. The landscape architect must work around what the building architect has already decided.

"Too often the landscape contractor doesn't distinguish between a building architect who has very little knowledge of plants, and a landscape architect who has a respectable degree of knowledge about plants," Carpenter says. "It varies with the school, but landscape architects generally have a year of plant identification and selection. This may be taught by other architects or by the horticulture department as is the case at Ohio State University."

"Generally, the landscape architect has enough knowledge to make overall basic decisions and to know when he needs a specialist," Behnke states. "We use the extension services or an arborist when we have questions."

Nationwide, 1,100 landscape architects graduate each year. Mississippi State has developed a landscape contractor program. It includes construction and business courses as well as plant information courses.

The landscape architect sees his plans as a creation, a thing of beauty. When a contractor doesn't respect this fact, the architect gets perturbed and sees his work being defiled. The landscape architect is very possessive and proud in his design. The contractor should understand this.

"The implementation of the design affects the overall impression regardless of how good the design is," Ed Able, executive director of ASLA, points out. "If it is not implemented properly, the whole impression fails. A less than pleasing product reflects more on the architect than on the contractor who implemented the design improperly."

At the same time, architects must realize that the contractor has daily exposure to certain types of plants in their area. They may be more familiar with failures and other problems characteristic to an area. If they see the problem plant in the specifications, they will bring it up and should be listened to.

Communication

The best solution to nearly all the conflicts between landscape architects and contractors is good communication. Respecting each other's knowledge, the two professionals should discuss specifications, payment, guarantees, improper acts by other contractors in the building contract, and anything that cuts into the profit of the job.

One method of improving communication is for the contractor and architect to join together into one firm. Known as design/build companies, they work often from a single contract for both design and construction. There aren't many large design/build firms in the U.S., but they are growing in number, especially in areas where the architect is not strongly based.

Another scale of design/build is the nursery or contractor that performs simpler designs for small commercial and residential construction. As these firms grow, however, it would be wise for them to hire a trained landscape architect for bigger design projects. The young landscape architect should be paid approximately $12,000 per year.

John Shaw, executive director of ALCA, states, "The more you integrate design, construction and planting materials, the better job you'll get because of communication. You'll also get more for the money and the least variance from specifications."

"It is sort of a construction management process which is becoming very common in the construction industry," Brickman remarks. "Design/build is growing because the client can be assured that the job will be done for the established budget and that good firms will produce a creative product."

Brickman continues, "The design/build concept goes against the old professional code that the landscape architect should not derive a financial benefit from the supplying or installation of a product he designed." The value of this idea is questionable as shown by the success of design/build.

ALCA and ASLA are working closely together to improve the architect/contractor relationship. Task force discussions are being held periodically across the country. Contractors might want to consider joining ASLA as affiliates. They can meet primary architects in their area through ASLA. They should also join ALCA to benefit from the progress it has provided its industry. *Bruce Shank*

WT&T

PROFILE

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ATHLETIC FIELD MANAGERS SAY BUDGETS ARE TOO LOW

Nearly two thirds of athletic field managers polled by Weeds Trees & Turf think their budgets for maintaining turf on athletic fields are inadequate.

Furthermore, inconsistent management structures of athletic fields and a lack of industry organization make pinpointing general characteristics difficult. Consequently, manufacturers may find it difficult to locate the person with purchasing responsibility and to better meet the needs of athletic field managers.

Pinpointing the person responsible is also a problem for trade journals trying to serve athletic field managers. This was a factor in the survey which received only a nine percent return out of 1,000 individuals polled. The 90 persons responding had 35 different titles.

According to the "Statistical Abstract of the United States", published in 1977, there are 2,700 commercial sports establishments, roughly 110,000 educational facilities with fields, and at least 19,000 municipal and county parks with fields. There should be at least 131,-700 managers of athletic fields in the U.S. Using the median annual field management budget of $10,000, the market has a conceivable value of $1.3 billion annually!

More than 70 percent of the respondents manage park (42 percent) or university (31 percent) fields. Fifteen percent manage high school fields, 11 percent municipal stadiums, eight percent middle and elementary schools, and only two percent private stadiums.

The respondents manage from 12 to 3,750 acres, with a median figure of 173 acres. Athletic fields are one part of the total acreage managed.

The managers have an average annual budget, not including labor, of $14,081. Figures ranged from $275 to $90,000.Sixty-three percent said their budgets were too small to maintain fields at a desired level. Thirty-seven percent said their budgets were adequate. Those responding negatively said they needed an average budget increase of 54 percent to obtain desired results. One individual said he needed a 300 percent increase.

Months Supplies Are Purchased.

Month	% Buying Chemicals	% Buying Equipment
January	7	8
February	12	9
March	21	16
April	18	14
May	9	9
June	5	8
July	4	8
August	7	8
September	7	5
October	5	6
November	3	4
December	3	5

Where Purchases Are Made

Item	Percent	Local Dealer	Manufacturer	Nursery
fertilizer	92%	71%	27%	2%
herbicide	82%	75%	25%	0%
seed	85%	76%	20%	4%
soil amendments	58%	76%	20%	4%

Equipment Owned by Respondents

Type	Percent	Mean	Leading Brands
Aerator	63%	2.0	Ryan, West Point, Jacobsen
backhoe	36%	1.1	Ford, John Deere, Case
broadcast applicator	77%	1.6	Lely, Cyclone, Scotts
line sprayers	38%	1.8	Hudson
mower	93%	4.5	Jacobsen, Toro, National
sprayer	60%	1.4	Meyers, Bean, Hudson, Broyhill
thatchers	26%	1.0	Ryan, Jacobsen
tractors	91%	2.2	Ford, John Deere, International Massey-Ferguson

Most purchasing takes place from February through May (see table). Fall buying does not appear as common as in other Green industries. Three fourths of chemical and seed buying is done with local dealers. Five percent said bids are required.

Despite dominance of spring and late winter buying, applications of fertilizer, herbicides, amendments and seed follow typical timing with spring and fall applications. Only six persons said they apply fungicides to athletic fields. Post-emergent herbicides are used to a far greater extent than pre-emergents.

The average amount of granular fertilizer purchased is about six tons per year. Liquid fertilizer is used in

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by less than five percent of the respondents. Manaaers purchase an average of only 525 lbs. or 80 gal. of herbicides.

Managers purchase an average of 900 lbs. of seed per year, with a median of 300 lbs. The same amount of amendments are purchased as fertilizer.

Forty percent said they resod their athletic fields with 20 percent resodding annually. The average expenditure for sod was $1,200. Three persons cut their own sod.

The primary grass seed used is bluegrass (63 percent), with rye (58 percent) and fescue (51 percent) close behind. Twenty percent use bermuda, which corresponds with the percentage of managers in southern states responding to the survey. Five percent indicated use of synthetic turf.

The dominant types of equipment used to maintain athletic fields are tractors, mowers, sprayers, and broadcast applicators (see list). Sixty-three percent also have aerators.

Quick coupling systems were the most common type (64 percent) of irrigation system used by respondents. Automatic systems are used by 36 percent. Seventeen percent indicated they had no irrigation system, although three persons said they used portable tanks for watering fields. Five percent use effluent water for irrigation.

The average size of staff under the manager is six persons, with a median of five.

Baseball fields are the most common type of field maintained. Football and soccer fields are the next most common types of fields maintained. Nearly three times as many baseball fields are maintained as soccer or football fields. A third indicated they managed stadium fields. More than 40 percent manage fields with bleachers and the same percentage manage practice fields.**WTT**

One example of the materials applied to football, soccer, and practice fields in the cool season turf area:

FOOTBALL FIELD: 2½ acres

April—1st week—Aerify four (4) times
April—1st week—Overseed with Victa/Baron Blend—25# per acre
April—1st week—Starter fertilizer w/Pre-Emergence—485# per year
May—3rd week—Dry fertilizer plus dicot weed control 330# per year
May—3rd week—Weedgrass preventer 370# per year
June—2nd week—Aerify four (4) times
June—2nd week—Dry fertilizer plus insecticide 450# per application
August—2nd week—Dry fertilizer plus insecticide 450# per application
September—2nd week—High density fertilizer 330# per application
October—2nd week—High density fertilizer 330# per application
November—2nd week—Overseed with Victa/Baron blend 25# per acre
November—2nd week Aerify four (4) times

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April—2nd week—High density fertilizer 1188# per application
June—2nd week—High density fertilizer 1188# per application
August—2nd week—High density fertilizer 1188# per application
November—2nd week—Athletic Blend 30# per acre
November—2nd week—Starter fertilizer 1584# per year

TOTAL COST.....$1399.00

SOCCER FIELD — 2½ acres

April—2nd week—Fertilizer with weedgrass preventer 370# per year
May—2nd week—Fertilizer plus Dicot weed control 330# per year
June—2nd week—High density fertilizer 330# per application
August—2nd week—Fertilizer plus insecticide 450# per year
September—3rd week—High density fertilizer 330# per application

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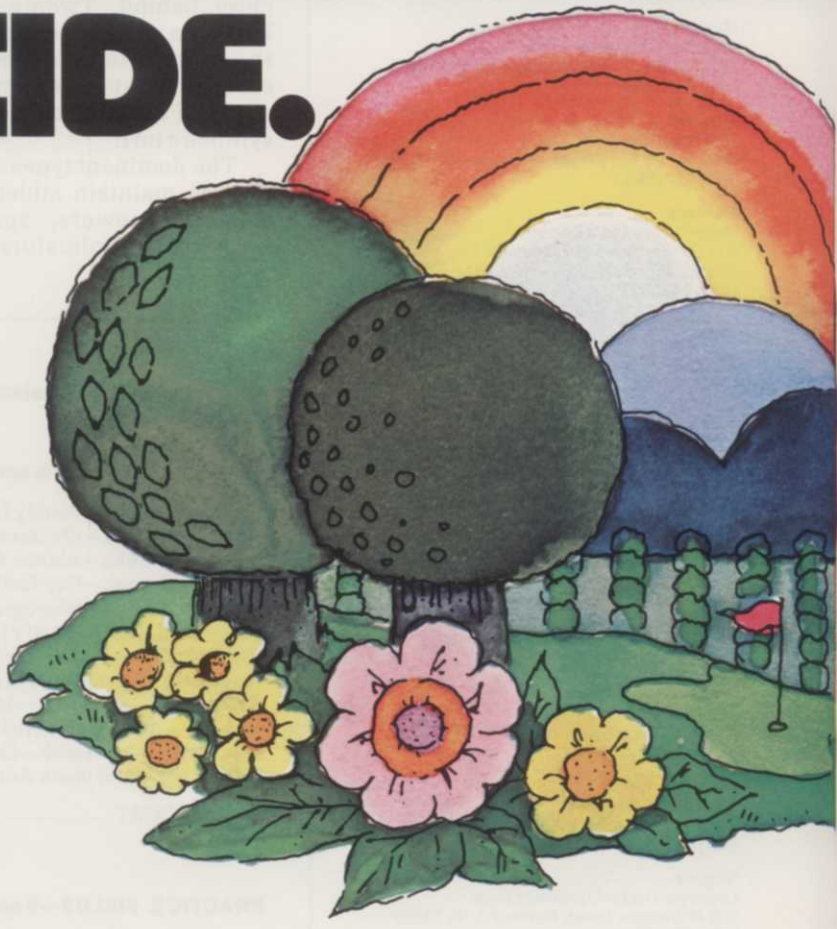

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LAWNS, TURF	ants, bluegrass billbug, chiggers, chinch bugs, cutworms, earwigs, European chaffer, fall armyworm, fleas, green June beetle, leafhoppers, millipedes, mosquitoes, sod webworm (lawn moths), ticks.

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PURDUE UNIVERSITY: THREE TYPES OF TURF

Melvin J. Robey is superintendent of athletic facilities at Purdue University, West Lafayette, Indiana, a position he has held for the last ten years. He received his Bachelor's degree from Utah State University and his Masters at Purdue, both in turf management. He is author of the book LAWNS, published by Davis McKay Company in New York and has another in the works which will be out soon.

After the sod is put down, it is lightly rolled. The PAT system does not have a crown.

All of the athletic facilities at Purdue University under the supervision of Melvin J. Robey are used extensively. They include an outdoor track, hockey field, baseball diamond, a natural turf practice field, a synthetic turf practice field, and the football stadium, a Prescription Athletic Turf system.

The stadium is used for spring football practice, anywhere from two to four times per week, averaging probably twice. In the Fall, it is used maybe 25 to 30 times for practice and games. It has also been used for the women's hockey games, and probably will be again this year. The field is seeded with a mix of Bonnie Blue, Baron, Nugget and Glade. It has just been recently resodded for the first time in four years. Plans in-

The first step in resodding the center of the practice field is removing the existing turf.

clude overseeding heavily this fall with Warren's A-34. The center of the practive field is resodded every year after spring ball is over. This includes an area about 40 feet wide and 30 feet long. The practice fields and baseball diamond have been overseeded with Manhattan ryegrass for the last ten years. This has proven to be a very tough, durable grass for athletic areas, according to Robey.

All of the fields except the stadium receive a complete fertilizer, including four pounds of nitrogen, per year. The stadium receives more.

Normal herbicide applications include a mixture of 2,4-D, dicamba and MCPP, depending upon the species of weed. Pre-emergence weed control includes applications of Dacthal. Diazinon and malathion provide insect control.

Grubs and the like have not been too much of a problem, says Robey, but leaf hoppers are, from a standpoint of annoyance to the football players.

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LAWN CARE INDUSTRY

Purdue University

The fields are normally mowed twice a week in the Spring and Fall, sometimes three times if growth is especially rapid. Frequency is cut down to once per week during the hot season.

Mowing height varies slightly for the fields. The baseball infield is mowed at one inch, while the outfield is mowed at 1¼. The other areas are all mowed at one inch. Height depends primarily upon the coaches preference, according to Robey, and management procedures are developed accordingly. The stadium is the only athletic field that is on a preventative disease program. Manhattan's susceptibility to pythium becomes a problem in the stadium, where air circulation is limited. The stadium is sprayed every ten days. The other fields are watched with a sharp eye for disease signs and sprayed accordingly.

Fusarium hasn't been a problem in the stadium, but dollar spot, pythium and leaf spot can cause problems if not kept after. Snowmold hit hard this year, hitting the ryegrass a little harder than the blue. Quite a bit of grass was lost, although not enough to cause major concern.

The stadium does have heating cables, but Robey wasn't able to use them at all this year, due to the coal shortage.

Equipment used to maintain the fields include a nine-gang reel mower, a seven-gang hydraulic reel mower, a smaller riding reel mower, a 48-inch rotary, and four 21-inch trim mowers. A monofilament trimmer is also frequently used. Utility vehicles include two trucksters, a pickup and a dump truck. A 100 gallon chemical sprayer and fertilizer spreader are used from the back of one of the trucksters.

There are three full time employees whose primary concern is athletic field maintenance. During the summer Robey picks up three to five college students.

Robey has found that he can maintain the natural turf systems with considerably less money than the artificial. He does feel a need for all three types of fields across the country. "The National League football players just held a vote and decided that they like the sand rootzone of the PAT system to play on the best," says Robey. (There are 11 PAT systems installed around the country presently.)

The Athletic Department at Purdue, of which Robey is a part, is responsible for maintaining its own facilities. Robey feels that it is much easier to maintain nice facilities under such a program. "I'm able to be associated much more closely with the various programs and coaches, and know what their needs are. I'm also able to explain my problems to them," Robey adds.

One thing Robey does like to stress, in maintaining athletic facilities, is that it is extremely important for the band to have a practice area other than the game field. Marching in place, as a band tends to do, creates severe compaction problems. The band will often do more damage to the field than the football team will." **WTT**

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ROLLINS COLLEGE: HEAVY USE OF EIGHT ACRES

Jim Boston is assistant to the physical plant director at Rollins College in Winter Park, Florida. One of his areas of responsibility is the grounds at Rollins, including the athletic facilities.

Rollins College in Winter Park, Florida, has only eight acres of athletic grounds. However, the patterns of use are intense, and Jim Boston, assistant to the physical plant director, fights problems common to all turf managers.

A fertilization program, and control of disease and insects are the items of major concern to him. However, he is limited to how much he can do and when, because the fields are in use almost constantly. The soccer field, for example, is also used for intramurals during the day and through the off sports season. "We're fortunate if we can keep the field in good shape half a year, much less a full year, because of this constant use," says Boston.

"We're involved with a very limited space. We're in an area that is built up in every direction with no room for us to expand. Our baseball outfield is used for soccer practice, because the game is so damaging to turf. The only area that we can treat properly and keep in a condition where we don't have an excuse is the infield of the baseball field, because it is not used for anything but baseball."

"The rest of the field does have some weeds," says Boston. "It has some worn areas, simply because we can't control it." Boston feels that the key to maintaining healthy turf lies in the root system. "When turfgrasses are trampled down, just worn out so to speak, they're going to bounce back and fill in the bare spots a lot faster if the roots are strong, deep and healthy."

One very important aspect of keeping healthy turf in the South is pH. "We use dolomite lime to keep pH at its optimum to get the best growth from the grass during the periods when you have to try and coax it to do so. We apply 10 tons per year."

"Every two or three months, I

"We're fortunate if we can keep the fields in good shape half a year . . . because of constant use."

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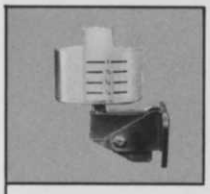

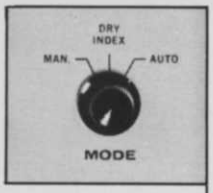

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Rollins College

will pull plugs from our fields and check the condition of the root system. If I am satisfied with it, but yet the greenness I want isn't there, I'll apply heavy nitrogen or iron to bring it out. If not, then I will apply something that will be more beneficial to the roots. When I'm trying to recover an area, I'm more concerned with the roots than I am the top. The top will come if the roots are there."

Both of the athletic fields at Rollins are bermudagrass. No overseeding is done, because the facilities aren't in use during the winter months. That can be good and bad, according to Boston. "We would like our facilities to be growing and recovering during winter, but they're not because it is winter. They're also not in use, so we're not really in that bad of a shape."

"Sometimes we have to water day and night to supplement the rainfall."

Right now is the rainy season, and the fields might get rainfall almost every day. This past winter there was maybe only one shower during three or four months. During those periods, Boston relies heavily on irrigation through his quick coupler system. "Sometimes we may have to water night and day to supplement the lack of rainfall. We don't like to water at night, because of the increase in disease susceptibility, but we're more concerned with keeping the grass alive than we are with fungi."

"I'd say that nematodes and mole crickets are our biggest pests. We have our fields treated for nematodes at least once a year. For some reason this also tends to drive the mole crickets out. It doesn't kill them, they just leave."

"Since our soil is 90 percent sand, and with the heat in Florida, we have a considerable weed problem. I approach it a little differently than most, however, because of the timing of our baseball and soccer programs.

Spring baseball practice begins right after the winter months and their game season comes in right behind that. So you've got a decision to make. Do you want to go in and kill the weeds and leave bare spots to gradually fill in, or do you want the games played ona green outfield. The spectators from the stands can't tell if they're weeds or grass. I wait until May before I treat for broadleaf weeds. I lose a month of growing time, but the baseball team had a green outfield."

"Do you want to kill the weeds and leave bare spots or do you want the games played on a green outfield?"

Boston does not consider the budget for athletic field maintenance high, neither does he feel that it is low. "You have to look at priorities. You've only got so many dollars for the school to work with and our athletic facilities are not on the very top of the priority list. We don't get the dollars that we'd like to have, but we get enough to do a decent job."

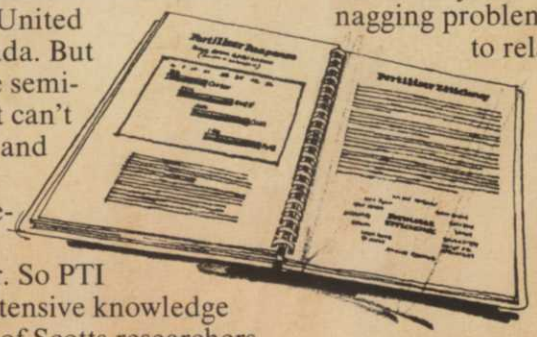
"We don't get the dollars that we'd like to have, but we get enough to do a decent job."

One full-time employee takes care of the athletic grounds. An additional person is hired during the summer. "I'm fortunate to have an individual that's taking care of the grounds who really cares about what he is doing and enjoys the results of his labor. That's the key to the whole ball game in taking care of turfgrass." **WTT**

What will be the most important news in turf maintenance this year?

Even the most up-to-date turf manager would have a hard time answering that one. Turf maintenance is a constantly changing business. And keeping up with those changes is a full time job. That's why we've been conducting information-sharing turf seminars for almost a decade.

Each year, Scotts Professional Turf Institute, PTI, presents seminars at more than a hundred locations throughout the United States and Canada. But it's not the same seminar each year. It can't be. The science and technology of turfgrass maintenance isn't the same every year. So PTI draws on the extensive knowledge and experience of Scotts researchers and pulls together what we feel are the most valuable pieces of information that we can share with you.



Soil testing, the role of micronutrients in turf growth, physical properties of soil, seed labeling, diseases, insects and weeds are just a sampling of the topics that have been discussed over the years.

Good, solid, technical information.

But, we're also well aware that most turf managers like to hear what other turf managers are doing. So we include interviews with successful turf managers from around the country; we ask them to share their thoughts and give you an insight into some of the practices they use or problems they've solved.

The seminars are structured, but informal. We openly invite participation. You may have faced a situation similar to the one being discussed... or, better yet, found a solution to a nagging problem that you may want to relate to your fellow turf managers. We strive to create the perfect environment for the exchanging of ideas. And testimony to our success is the number of turf professionals who take a day away from their busy schedules every year to attend.

Your ProTurf Tech Rep can tell you when the next ProTurf seminar will be scheduled in your area. (If you don't have regular contact with a Tech Rep, feel free to call the **toll free Scottline: 800/543-0006.** In Ohio, call collect: 513/644-2900.)

We'll be looking forward to sharing some ideas with you.

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75TH ANNIVERSARY

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KEYS TO FINANCING A BUSINESS EXPANSION

By Rod Bailey, President, Evergreen Services Corp., Bellevue, Washington

Finding capital to finance expansion of a small, successful business is one of the major challenges faced by the "green industry" in today's economic environment. Financial institutions are highly tentative about our industry because of their previous experience with it and because of lack of knowledge of the industry now and its challenges and opportunities.

Your response to the situation should include four areas of activity. First, **educate your banker about our industry.** Obtain, read, and give your banker a copy of ALCA's reports I and II titled, "Landscape Contracting Today and Tomorrow." We have found this tremendously helpful in broadening our banker's visibility and knowledge about our industry. Also, obtain and compare yourself to industry statistics on operating costs and financial performance. This will give both you and your banker additional perspective on the industry and your place in it.

Such data has been accumulated by several trade associations including the Associated Landscape Contractors of America (ALCA) at 1750 Old Meadow Road, McLean, Virginia 22101; American Association of Nurserymen (AAN), 230 Southern Building, Washington D.C. 2005; and the Horticultural Research Institute (HRI) also at the above Washington D.C. address. Most banks have access to their own industry data, but it is limited in scope for the green industry. ALCA and HRI data is more relevant to the landscape contracting and wholesale growing segments of the industry and firms compare more favorably to this data.

We have found that membership in the national or state trade association which is most relevant to your operation is highly valuable. The associations have much relevant published data and sponsor a growing number of specifically targeted management seminars. This is an excellent way to upgrade our industry and personal professionalism.

Second, **develop a business plan.** This is essential and should be developed in your own terms so that you know where you are going and can convince sources of financing that you do. The plan should include a description of what you plan to do to expand, how you plan to do it operationally, how much money is required to finance it and, finally, how you plan to pay it back.

Third, **obtain qualified help to express your financial plan.** If you don't have the knowledge to work with the facts and figures yourself, retain the services of a qualified local accountant or consultant who can organize an efficient accounting system with periodic financial reports. With his help convert your operating plan to its financial implications in the form of cash flow projections, projected income statements and projected balance sheets. This will be some of the best money you ever invest in your business.

Bankers or any source of money, including yourself, will need to be convinced that you know where you have been, where you are now, where you are going, and that either you personally or your business will have the ability to repay loaned or invested funds. Your ability as a manager and your ability to demonstrate it are of great importance.

The U.S. Small Business Administration has many "how to" publications covering the above subjects for the small businessman. These should be available through your closest SBA office and are valuable sources of information. Small business counselling assistance is also available through the SBA.

Finally, after you've done your own homework, **go looking for sources of financing.** These can include yourself, by remortgaging your home or other borrowing, a commercial bank who sees the merits of your presentation, relatives or friends who believe in what you are doing, the Small Business Administration either directly or through a guaranteed bank loan, or a venture capital oriented Small Business Investment Corporation (SBIC). The sources you choose will be influenced by whether you are looking for debt financing, equity financing or combinations of both.

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MAKE WAY FOR DIESELS IN TURF CARE EQUIPMENT

By Thomas M. Carter, Manager of Engineering, Turf Products Division, Jacobsen Manufacturing Company

Fuel-thrifty engines that deliver high torque, greater life expectancy, and are easy to maintain are about to make inroads as power units for smaller turf care equipment.

Small displacement diesels, in the 20 horsepower vicinity are on the way, promising highly attractive power alternatives to users who have tougher requirements.

Up to now, these smaller turf machines have been powered by gas engines, traditionally air cooled units but more recently optional water cooled plants which are introduced to provide turf men with the added life that lower rpm's, cooler operating temperatures and higher torque can mean.

Diesel technology has never been very far away. Across the turf over on the highway, diesels have long been the accepted power for hauling tons of products and passengers.

Truck and bus diesels generate enormous torque, little horsepower, but extreme longevity. Greyhound gets up to 600,000 miles out of its diesels before major overhaul.

Torque rating, rather than horsepower, is a characteristic worth considering. Torque is sheer twisting force. It comes on at a much lower rpm level than horsepower. High torque rating let the big automotive engines of the 1920's and 30's accelerate from a crawl to 80 mph in high gear without hesitation. It's the performance measurement that for years has been overshadowed by horsepower ratings.

In recent years, diesel technology has advanced considerably, particularly engine speed. Older diesels could produce great amounts of power within a narrow rpm range. This left truckers and bussers doing a lot of shifting to get their rigs up to speed. But this somewhat constant rpm characteristic was hardly suitable to automotive use. Thus came the very recent development of small diesels that rev from idle all the way to 5500 rpm, such as used in the Volkswagen Rabbit, GM's Oldsmobile, etc.

The small turf diesels, however, rev lower than the new automotive units. The turf power plants are designed to produce ample power within a lower and narrower speed range, with torque coming on strong at about 1600 rpm (compared to about 3000 rpm for peak horse power in a similar gas engine).

Plenty of power at lower engine rpm's is an important diesel feature for turf applications, since these machines are operated at a fairly constant speed anyway. In addition to longer engine life, the lower speed means less fuel is consumed.

Diesels are different from gas powered engines in other respects. For one, there is the method of ignition. While gas units use a spark to ignite fuel, diesels rely on very high compression (encouraged by a heat plug for starting) to generate heat to ignite the fuel. Typical diesel compression ratio is about 19 or 20 to 1, compared to about 8 to 1 for a gas engine. The high compression necessitates a huskier engine design, from the crankshaft and its bearings right up through combustion chambers, cam shaft, valving, etc. This method of ignition also means diesel uses no spark plugs, points, coil, condenser or other elements needed to fire a gas engine.

The simplicity of diesel ignition obviously translates to simpler maintenance procedures and none of the costs encountered in replacing gas ignition system components. It's a safer engine, too, having no wiring, etc., that might short out and cause a fire.

Fuel delivery is different, too. Thicker in consistency than gas, diesel fuel is injected into the combustion chambers rather than sucked in by the

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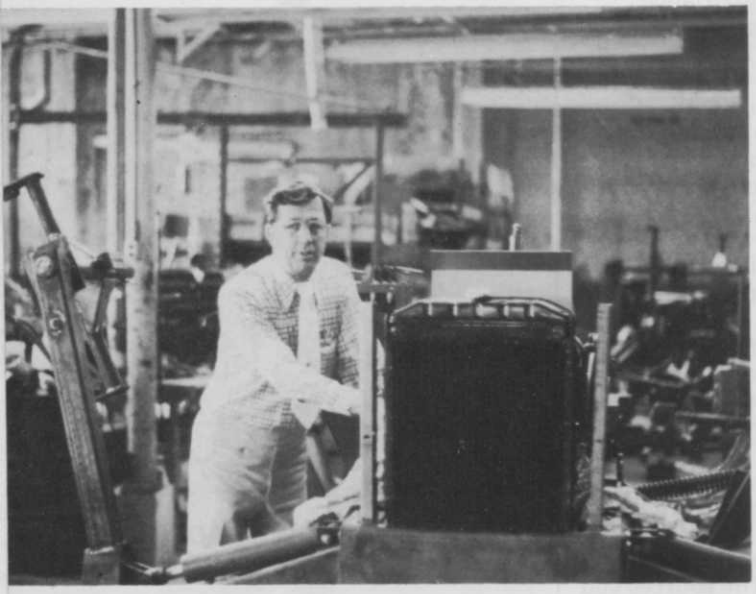
Thomas M. Carter, Manager of Engineering, Turf Product Division, Jacobsen Manufacturing Company, has made a career of engineering turf, agricultural and related equipment. At Jacobsen, he is responsible for the design and development of new turf products, enhancing current equipment, field and in-plant testing, experimental programs, and cost analysis and comparisons.



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down stroke of a piston via a carburetor. In terms of routine maintenance, these injector systems are considerably more simple than carburetors, requiring little or no adjustments. Normally, only fuel and air filters require periodic replacement. The fact that diesel fuel can't be bought at every filling station should not present a problem for turf people, since they usually obtain fuel in bulk for storage.

Other drive line components, clutch transmission, etc., are much the same as they are for a similar gas unit. Likewise for the cooling system. The generator, really needed only for lighting and to keep the battery charged for heat plug starting, would be a lower capacity unit.

Translating these benefits to actual applications, it's easy to see why diesel power will gain favor.

Take, for example, the landscape maintenance field. This is a high-growth industry that has become quite sophisticated over the past decade. Contrary to the image of a pickup truck, a couple of mowers and laborers to push them, the commercial landscape maintenance operation contracts with municipalities, utilities and industrial parks to keep the grounds in prime shape year after year.

To these entrepreneurs, time is money. They're in the business of maintaining attractive settings, on a contract basis, and this means machines must be reliable, simple, economical, and have a long life — in addition to doing their primary job well. Just as in a production plant, when equipment is down, manpower is wasted and production is lost.

Landscapers represent the production-oriented end of applications. But other segments are changing, too. As budgets tighten, a greater emphasis is placed on performance by golf superintendents, park district supervisors, cemetery maintenance people, and others. And this calls for equipment that measures up to the same performance criteria.

Another change among users generally is the tendency toward less equipment maintenance. Certainly, many have well-qualified mechanics on hand to undertake routine work, and some distributors maintain facilities and staffs. But, in the interest of keeping the machine going, maintenance is sometimes overlooked — changing plugs and points, replacing the air cleaner, redoing the head, and so forth.

Longevity is an important adjunct to performance. Users need equipment that will go well beyond the traditional one season of extensive use before valves may need attention after 500 to 750 hours of heavy use. After all, these machines run for many hours, often operated by personnel who are not mechanically inclined.

Seasonality plays an important role, too, with year-around use for some regions and six months for others.

Diverse operating conditions call for engineering a very high degree of self-preservation and long life into equipment. This is why Jacobsen introduced its four-cylinder water cooled gas engine as an option to the Out Front Commercial — to extend life through cooler operating temperatures — and why the next step to diesel power for smaller turf equipment is being taken to multiply engine life another three to four times.

Generally, the diesel will cost users more at the outset, but deliver healthy returns on investment during a more rigorous operating life. By present and foreseeable standards, emissions are less of a problem.

Not that diesels have been unknown to the industry. Diesel power has been an alternative to gas engines in the larger turf tractors for about the past decade. These machines, almost agricultural in size, are used for such heavy duty work as pulling large gang mowers that cut swaths up to nearly 20 feet, or pulling large aerifiers, seeders and the like. They ply the turf at golf courses, recreational and other large areas where using smaller units would be impractical.

Jacobsen now offers diesel power in five turf tractors. They use 192 cubic inch displacement (CID) engines that produce 65 hp at 2400 rpm, and 160 ft. lbs. torque at 1600 rpm. Running with 16.5 to 1 compression, these four cylinder power plants are manufactured to our specifications by Ford.

Just as in the automotive industry, we see diesel engines gaining wider use in the turf care industry. With the availability of the small diesel, the trend can only accelerate over the coming years.

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Can Exhalt®800 cut your fungicide cost in half?

Many turfmen say yes. Our lab tests confirm it. Don't you at least owe it to yourself to spend three minutes reading the story?

For years, fungus disease control has been a source of trouble, frustration and expense. The problem is not the fungicide itself, but the application: how to keep it in place despite torrential rains and irrigation. The problem is wash-off.

That's why the development of Exhalt800 is a milestone of progress in the turf world. Here's the story:

Unlike many sticker-extenders that give little help, Exhalt800 encapsulates every fungicide particle with an armor of protection . . . a sticky, flexible "fabric" that clings to turf and foliage, essentially on contact. Yet it flexes and "breathes" to allow normal plant growth.

Because Exhalt800 keeps much of the fungicide in place, even in extreme weather, it can double or triple the control period. Even if it rains an hour after application, you'll still have effective control (see test chart), with less wash-off and less build-up of residue in soil.

Using Exhalt800, you may save 50% or more because you will need fewer sprays, you will use less fungicide with each, and reduce labor costs proportionately. Meanwhile, you can be confident the disease won't flare out of control. The evidence is clear.

In university field tests using leading fungicides, Exhalt800 added to spray tank at minimum-label recommendations gave control equal to higher recommendations without Exhalt800. With higher Exhalt800 dosages, you can double or triple the control period. Results can vary with the kind of fungicide used.

Exhalt800 costs little because it goes far (mix one pint with each 100 gallons in spray tank). Won't damage turf, trees and ornamentals when used as directed. Easy to use: add to spray tank and agitate. Easy clean-up: rinse equipment with water. If frozen in storage, Exhalt800 won't separate; may be thawed and used.

Too good to be true? The question doesn't surprise us. Compared with its competition, Exhalt800 *is* hard to believe. To know the truth, you should test it. On a golf green. A fairway. On any fungus-infested lawn or foliage.

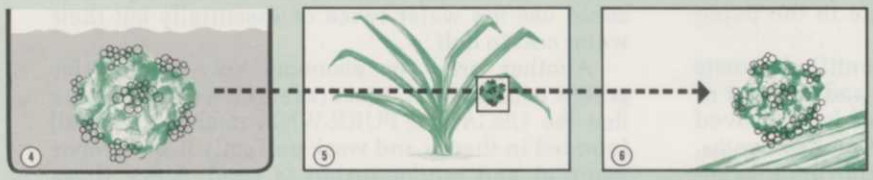
As an efficient manager, can you ignore the overwhelming evidence? See your Gordon distributor for information, prices and technical assistance.

A closer look at Exhalt®800 — the reason it works

1) Microscopic particles of fungicide are suspended in water in spray tank.

2) One minute fungicide particle, greatly magnified. Countless millions of such particles in water become the spray solution.

3) Exhalt800 liquid enters spray tank. Hydrophobic (repelled by water), it breaks into a myriad of tiny droplets and attaches to fungicide.



4) Tiny Exhalt800 droplets form a porous, flexible "fabric" that encapsulates each fungicide particle (enlarged to show detail).

5) Turf, when sprayed, becomes coated with millions of fungicide particles, each particle encapsulated within the porous "fabric" of Exhalt800 droplets.

6) Encapsulated fungicide particles on blade of grass (magnified portion). The Exhalt "fabric" around each particle is porous and flexible; it lets plant "breathe", flex and grow, releases fungicide slowly.

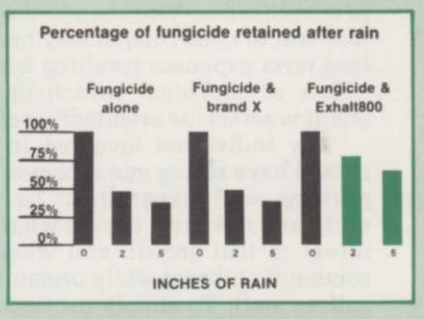


Chart shows how Exhalt800 resisted wash-off in a laboratory test. Spray coatings were applied to glass panels and dried 10 minutes at approximately 70° F. Retention after erosion by rain was measured by solvent stripping the panels and determining the residual fungicide by quantitative ultraviolet spectroscopy.

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MORAL COMMITMENT, CONSERVATION WITH TURF URGED BY BOARD

Michael J. Hurdzan, Ph.D.

Michael J. Hurdzan, Ph.d., is a partner in the golf course architectural firm of Kidwell & Hurdzan, Inc., Columbus, Ohio. Hurdzan grew up around a golf course where he served as shag boy, caddie, and then greenskeeper. During college he owned and operated a landscape maintenance company in Vermont. He joined Jack Kidwell in 1970 to form the architectural partnership.

Hurdzan received his Masters and Ph.D. degrees in plant science from the University of Vermont. He is currently enrolled in the landscape architecture program at Ohio State University, Columbus.

He is a member of the American Society of Golf Course Architects and the American Society of Landscape Architects. He is currently writing a book on the history of golf course architecture.

"The current state of golf course architecture is that more men are attempting to practice golf course design in a period of declining golf course starts. Consequently, the competition between designers is keen with the client receiving more personalized service than in the past. Since the initial cost of construction may be small compared to long term expenses resulting from improper application of technical principals, it behooves the client to select his architect carefully.

Any individual involved in the golf industry should have strong moral committment to keep golf growing and expanding. To honor that committment, one must decide what poses the greatest threat to that growth and what must be done to combat that threat while promoting the pleasure of golf as well. To simply promote golf will not suffice. Then, what are the threats to the expansion of golf and how may the golf industry in general, and the architect specifically, contribute to the popularity of golf?

Perhaps the two most easily identified threats are the time required to play golf and the cost of golf. Although, the time to play golf has received much attention, it may not be as serious as it seems. To take half a day to play golf is equivalent to going: skiing, hunting, fishing, card playing, hiking, camping, swimming, etc. Lots of leisure activities consume as much or more time than golf and many times without the benefit of sunshine and fresh air. But efforts should be made to reduce playing time, if possible, by designing shorter golf courses, scenic but less hazardous holes, fewer unmaintained periphery areas that receive much golf activity (slick side areas in particular), or one of a hundred other suggestions printed in articles in the last couple of years. The golf pro and superintendent actually have more influence over playing time than does the architect.

However in matters of costs, the golf course designer has great influence. When a golfer talks of the high cost of golf, one of the items first mentioned are greens fees that may run from $6.00 to $15.00 for 18 holes. There is real danger that if the cost of new construction and maintenance does not level out soon, and greens fees inflate, then golf may again become a rich man's game. This would be a tragic loss to the spirit of the game and to the industry.

How then, can we help reduce construction and maintenance costs and ultimately the cost to the golfer? Golf courses should have as many of the built-in minimum maintenance and artistic features as possible. But, since these features are costly, there must exist a compromise between total construction cost and the number of features. For example, in many areas of the country, bluegrass can go 14-20 days without water before it shows declining vigor. This desiccated turf once watered satisfactorily, recovers and can go another 10-14 days before showing drouth symptoms. Thus, it may be that with ordinary rain patterns of once a week, that bluegrass fairways would require supplemental water only five times a year depending on soil types and mowing heighth of the turf. Installing a manual fairway irrigation system instead of a fully automatic system may reduce the initial construction cost by $40,000 to $100,000 depending on the system. Also, many parts of the country have already experienced water shortages and golf courses are the first to be denied. In these areas, irrigation needs and water availability must be analyzed, for to specify a first rate system with limited or no water available may be wasteful. The American Society of Golf Course Architects Research Foundation, recently made a grant to the Universtiy of Florida to study golf course use of waste or recycled water. If a system using recycled water was developed, the clubs buying city water could use the water twice or essentially cut their water cost in half.

Another area for economy may be interior greens construction. Most research would indicate that the USGA and PURR-WICK methods are well founded in theory and work perfectly if the proper material and workmanship is used. Since these greens construction methods are so precise, much hand labor and very special materials are required with a resulting increase in construction cost. In the midwest, another type of green is being built that may not stand the rigors of scientific testing as well, but they grow excellent turf, rarely need to be aerified, and cost about $60,000 less for 18

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greens. This savings may make the difference between a golf course being built or not.

A reduction in the use of exotic or expensive materials may result in substantial savings that can be passed on to the golfer. More experimentation needs to be done with organic soil amendments such as rotted sawdust, leaf mulch, ground corn cobs, etc., to replace the sometimes costly and unavailable organic peat. Organic peat delivered to a job might cost $15.00 per yard while well-rotted sawdust might cost $3.00 per yard. This $12.00 savings times the 1,000 yards required for an 18 hole course is another $12,000 not spent.

Construction of golf courses on suitable but inexpensive land can provide golf at a reasonable cost. These areas are usually flood plains, areas under airport flight paths, industrial right-of-ways, preserved or unused park land, or long-term lease land. By reducing the high cost of land acquisition, low-cost golf can be enjoyed and still be profitable for investors. The architectural features must reflect the problems of the site, even if it means a loss in aesthetics.

The golf course architect of tomorrow must not only be an artist and applier of developed technology but he must also become an innovator in reducing the rising costs of construction and maintenance. The accomplished designer is not one who takes a superb site and an unlimited budget to produce a great golf course capable of hosting the U.S. Open. Rather, the truely talented designer is one who can take a poor or marginal site and a low budget and produces a golf course that provides hours of pleasure to hundreds of people at a low cost. The man who can do this has indeed proved his professionalism, expertise, and talent; and honored his commitment to keep golf a popular game for all people. **WTT**

Robert C. Shearman, Ph. D.

Dr. Shearman was appointed extension turfgrass specialist and assistant professor of horticulture for the University of Nebraska, Lincoln, in 1975.

Shearman's research includes turfgrass breeding and stress physiology. He has written numberous articles for trade publications and has spoken at major industry shows across the U.S.

Shearman received his Ph.D. and M.S. in turfgrass physiology and management at Michigan State, where he was a research assistant. His B.S. was earned at Oregon state University.

Shearman is an advisor for the American Sod Producers' Association. He is a member of the American Society of Agronomy, the Crop Science Society, Nebraska Golf Course Superintendent's Association, and the Nebraska Turfgrass Foundation.

He and his wife Linda, who also has a degree in agronomy, have two children.

Since the onset of the energy crisis there has been a growing awareness for the need to conserve energy, water, and other natural resources. Along with his awareness, increased emphasis has been placed on the production of food and fiber. These developments have cast an unfavorable image on the turfgrass industry, relating turf as an ornamental or aesthetic crop rather than the functional plant material that it is. Many of us have become submissive and have accepted this negative approach as reality, when in fact we should be on the offense.

Aesthetics are an important aspect of turfgrasses and allied plant materials, but the functional aspects of these areas are equally or more important. Numerous articles have been written that support turfgrass contributions to the environment and individual's physical and mental well-being. In addition, turfgrass research has advanced rapidly in the last 25 years. We are growing more sophisticated as a science in our knowledge of turfgrass plants, culture, pest management, and breeding. As an industry we are keeping pace or exceeding other agricultural industries in our efforts to reduce energy and water consumption.

Turfgrass science and culture is not without problems. This is what makes it interesting. There is a growing emphasis for low maintenance grasses and cultural systems for low maintenance areas. In many areas water quantity and quality are becoming more critical. Improved drought and salt tolerant grasses as well as better understanding of water management are needed for these areas. Government regulations are more restrictive and have limited the scope of available pesticides for pest control. A greater emphasis must be placed in the future on pest management, efficient use of pesticides, and development of resistant turfgrass cultivars.

Present trends in this country will continue to place an emphasis on the need for conservation of energy, water, and other natural resources. Smaller homelawns and multiple dwellings are likely to be the case in the future. More turfgrass areas will fall in the low maintenance category. Population and leisure time will increase, while the availability of land for expansion of turfgrass facilities will decrease, necessitating intense management requirements on some parks, golf courses, and athletic fields. Research efforts for the future will have to address both of these problems, as well as strive for a more basic understanding of turfgrasses. The turfgrass manager will be forced to become more technical and sophisticated in his efforts to develop cultural systems. **WTT**

VEGETATION MANAGEMENT

By **Roger Funk,** Ph.D., Davey Tree Expert Co., Kent, Ohio

Q: *I'm in the lawn care business, applying fertilizers, herbicides, pesticides, etc., to commercial and residential lawns. In researching and attempting to improve one-application response to lawns that have a normal six-to-seven month growing period, is it best to have three or four applications during the year? Also, what are maximum levels of nitrogen, phosphorus and potassium per 1000 square feet? What trace elements show the best response?*

A: Fertilizer requirements can be supplied in any number of applications by varying the soluble: insoluble nitrogen ratio. Thus, the required number of applications is dictated primarily by the proper timing for the pests you are programmed to control. Most lawn care companies in the northern states have found that four applications provide the most effective pest management.

The optimal level of nitrogen will vary with the grass type, soil conditions, etc., but, in general, 3.5 to 4 pounds per 1000 square feet is sufficient. Phosphorus and potassium levels are more variable and should be determined by soil testing and turf response.

Micronutrient deficiencies may occur, particularly in alkaline or sandy soils. Iron is more often deficient than any of the other trace elements, but this should be determined by foliar analysis and confirmed with test plots.

Q: *Last year our company stripped 10,000 square feet of lawn and replaced it with bark mulch two inches deep and a planting of rhododendrons (Rhododendron maximum) and red pines (Pinus resinosa). We are now being plagued with tremendous grass and weed growth. We have applied weed and grass killers to no avail. Do you have any suggestions?*

A: A black plastic film laid down before the organic mulch is applied will significantly reduce the potential for weeds.

For pre-emergence control of annual grasses and broadleaf weeds in mixed red pine and rhododendron plantings, you might try Dymid or Enide. If the ornamentals are not interplanted, you could apply Simazine to the soil around the red pines, and apply Casoron to the soil around rhododendrons.

For post-emergent control, you can't beat Roundup for non-selective control.

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PROSCAPE

By Michael Hurdzan, Ph.D., golf course architect and consultant

Q: *We plan to reseed our tees and fairways to bluegrasses. Which ones are best?*

A. The precise "best ones" for your tees and fairways depend on the effective climate of your golf course, properties of the soils, and your management operation. Although there are many improved bluegrasses on the market, some appear to be better adapted to certain cultural conditions than others. By analyzing the cultural conditions on your golf course and seeking test results or field experience produced under similar conditions, the best ones will be evident.

The effective climate of your golf course is the total spectrum of limiting growth or survival factors such as high and low temperature extremes, associated relative humidity, air movement, altitude, sun angle or facing slopes (north or shade slopes vs south or sunny slopes), and the surface and subsurface drainage. An intelligent integration of these factors will indicate which experiment station or turfgrass evaluation site is most like your course.

It could be that if your course is on the north side of a Tennessee mountain that a turfgrass test area with the effective climate most like yours is found in Michigan. Similarly, there are areas in river basins of Kentucky that could get their most meaningful information from Georgia. Plants do not respond to state boundaries but rather they react to a multiplicity of environment factors. After assessing the climate, blend in the growth permitting properties of your soils including drainage, the chemical, and the physical characteristics of the soil.

Since soil modification over areas as large as tees and fairways is impractical, the turf cultivars selected should have proven ability to grow vigorously in your soils. If such information is not directly available from a research site, check with other turf managers near you that may have similar cultural conditions that may have some experience with the cultivar that interests you. However, the most reliable procedure is to put in a small test plot or several plots and evaluate the cultivars yourself.

Q: *In order to insure turf and planting compliance with government contract plans and specifications, with very limited inspection, what techniques, procedures, and recommendations can be given?*

A: I do not believe that there is any substitute for inspection. We have consistently found that the quality of the work received is directly proportional to the inspection that we give it and thus we base our fee on providing that inspection. If for some reason you can not provide that inspection, then require the contractor to guarantee his work for at least one year and have him provide the owner with a maintenance bond.

On golf courses we require the contractor to produce "an established stand of grass in those areas where he can irrigate" as part of the specifications and his contract. This means that the contractor shall provide post-planting care that may extend for 6-8 weeks past germination. The contractor uses the owner's equipment, but he is required to water, fertilize, and mow as needed during this period. When the contractor must guarantee the results, he finds it is cheaper to adhere rigidly to the plans and specifications no matter how often he is inspected.

Q: *Sand base turf fields for sports require repeated topdressing with sand similar to that used for the base construction. To my knowledge, there is not a spreader on the market to apply such quantities of sand uniformly. A large seed drill, converted to a spreader with reinforced box and a central floating wheel and tire to displace some of the load would do the job. Although the demand is there, no one seems interested in meeting it. Do you know of anything to fill the bill?*

A: I do not know of anything, but your idea sounds interesting and may work very nicely and inexpensively if you can find an old seed drill. If you should decide to build such a spreader and you are satisfied with it's performance, please send us some pictures so we pass it on to our readers.

Although there are good small topdressers available on the market, many turf managers still find that they do not fill their specific requirements. This dissatisfaction with factory models is a result of widely varying attitudes about type, consistency, and dryness of the topdressing mix and the amount that each manager wants to apply. For this reason I doubt that any one topdresser would be acceptable to all people. However, several other suggestions of equipment used by others may spark an idea for you.

An old lime spreader is used by some, with and without modifications. This unit usually has a strong materials box and undercarriage and only wider, flotation tires are needed for turf use. Some have tried rotary attachments to small dump trucks similar to those used in road salting operations (with much greater capacity, though) and thus spread pure sand right from the truck. Others are using a pull type, rotary spreader equipped with a "sand ring", only filling it about ½ to ¾ full to keep it stable and reduce compaction. When using the sand ring, some superintendents use the unit as is, some use the deflector shield to limit throw to 18-20 feed wide, and others have modified the spinner by either lengthening or shortening the impellor or spinner arms depending on the materials and the result that they want. **WTT**

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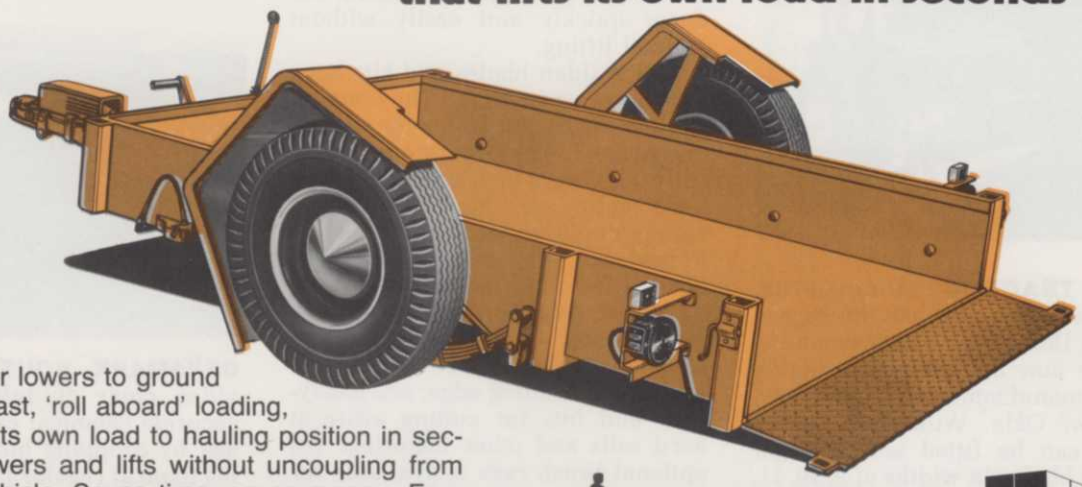

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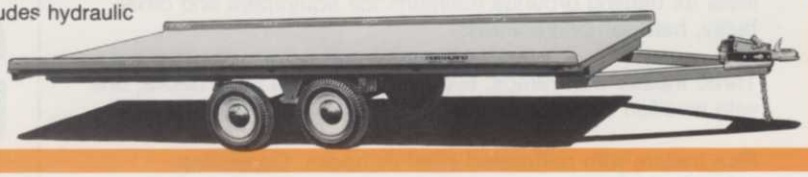

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PRODUCTS

FORD TRACTOR Model 9700, can now mount and use the rugged Waldon Dozer Blade with mounting kits just now being made available by the manufacturer, Waldon, Inc., Fairview, Okla. With the kit, the tractor can be fitted with straight Waldon blades in widths of 9, 10, 11, and 12 feet or angle blades of 9½, 10½, 11½, and 12½ foot widths. The new mounting kits come with all necessary hardware (except cylinders) and an owner-operator manual showing in detail how to mount the dozer quickly and easily without manual lifting.

All Waldon blades and kits have a two-year warranty. They mount solid to the tractor frame for rigidity and strength. They operate hydraulically with two 8-inch stroke, 2½-inch bore cylinders, have adjustable cutting depth and a hold-out device to replace cylinders when they are needed for other machinery.

Other Waldon Dozer Blade features are: adjustable skid shoes; all replaceable parts; reversible and replaceable cutting edge; and heavy-duty end bits for cutting away at hard soils and other materials. An optional brush rack is available for mounting above the blade for better handling of loose material and protection of the operator.

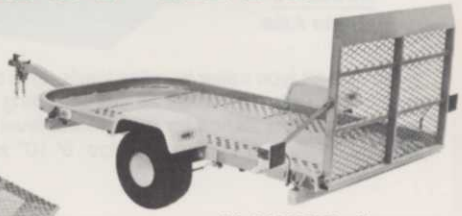
Circle 701 on free information card

DEVAMARK BOUTMARKER provides clear guidelines to insure accurate chemical or granule coverage by dropping blobs of long-lasting foam at regular intervals on either side of the sprayer. The non-toxic foam lasts about 40 minutes, even in wind and drizzle.

The equipment pipes air from an

Snowco offers the all around utility trailer line

Model 20-005 with standard wheel covers



Model 20-002 with standard hub caps

Take your choice of eight flatbed trailers with loading ramps or tilt decks, plus a box bed trailer with tailgate. They're ideal for hauling grounds maintenance equipment and other bulky, hard-to-handle items.

Three trailers with ramps; two with perforated steel decks, one with wooden deck. Capacities 1,150 and 2,100 pounds.

Five trailers with perforated steel tilt decks. Capacities 1,000 to 3,500 pounds.

One steel box bed trailer with optional canvas or fiberglass cover. Capacity 1,200 pounds.

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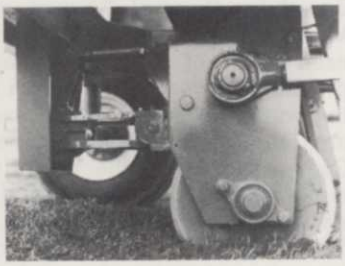

- **NEW...HIGHER SPEED CUTTER HEAD**—Provides minimum vibration, maximum ground control and *excellent cutting under both wet and dry conditions.*
- **TEMPERED STEEL BLADES** — Last longer...easy to sharpen or replace.
- **COMPLETELY ADJUSTABLE** — Width and length of slab, plus depth of cut.

- **DUAL REAR WHEEL CONFIGURATION** — Provides better flotation...wider weight displacement in the field...easy maintenance.
- **FLOTATION TIRES** — Choice of turf or lug design.

- **STACKER PLATFORM** — Improved, single level design provides greater comfort and efficiency.
- **IMPROVED SAFETY RAILS** — Provides greater stacker safety and security.
- **UNIQUE LOWERING SYSTEM** — Keeps sod at a convenient height...less fatiguing for stacker.

Optional Equipment

- Headlights for night cutting.
- Stacker Spotlights
- Pallet Counter
- Pallet Scale
- Tachometer
- Stacker Safety Horn
- Sun Shades (front & rear)
- Engine Hours Meter
- Sod Slab Counter (electronic or mechanical)

- **PERFORMANCE**—Harvests up to 2500 sq. yds. (22,500 sq. ft.) of sod per hour.
- **CONSTRUCTION**—Strong, light weight, welded tubular steel throughout.
- **NEW COMPACT DESIGN**—Provides tighter turning radius and improved handling.
- **HYDROSTATIC DRIVE**—Allows infinitely adjustable speed control for proper cutting under all conditions.
- **CENTER CUT**—Eliminates side draft... continuous strip of sod means less waste, more profit.
- **POWER SUPPLY**—Ford 192 gasoline engine (standard)...Ford or VM diesel available.
- **REDUCED LABOR COSTS**—Operates with two or three man crew...save up to 75%.
- **REPLACEMENT PARTS**—All parts and components are standard and easily available.

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955 W. Walnut St.
Canal Winchester, Ohio 43110
Phone (614) 837-9096

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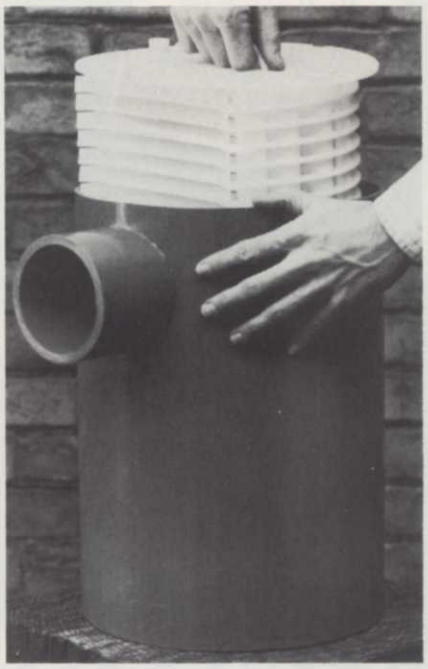
princeton mfg. company

electric compressor to a high density polythene container holding the specially formulated foam, which is forced through PVC piping to dispensers. Two pairs of dispensers are supplied: round tubes for solid foam blobs on bare soil, short grass or stubble; and fishtail-shaped attachments which lay ribbons of foam on long grass or standing crops.

The compressor, which uses about 7A power from the battery, and the seven-gallon foam container are mounted in an integral unit measuring 12-inches wide by 16.5-inches high by 20.5-inches long. Standard fittings include a pressure gauge, pressure relief valves, battery cable, cab switch kit, and 80 ft. of three-quarter-inch bore dispensing hose. Foam comes separately in five gallon packs.

Circle 702 on free information card



GO CATCH-IT, a multi-purpose filter utilizing Zabel Disc Dams for liquid reclamation has just been introduced by General Equipment and Manufacturing Co. The filter may be used ahead of irrigation pumps for protection or as a filter when drawing water directly from a reservoir or stream. The adjustable Zabel Disc Cam assembly in the filter is normally set to filter out any biological sludges, water works sludge, light flocculent sludges or other particulates above 0.0625-inches and may be factory set for other sizes.

While the filter is self-cleaning, the assembly may easily be slipped out of the sewage and acid resistant PVC case for manual cleaning or a back-washing valve may be attached to the effluent tube for automatic flushing.

Circle 703 on free information card

"Sound Conditioned" M & M Brush Chippers for... less noise... more efficiency

Applying engineering designs which "Sound Conditioned"* our industrial scrap reduction machinery, Mitts & Merrill can modify our brush chippers for low noise levels. At the same time, those engineering features which have made Mitts & Merrill the leader for years have been retained.

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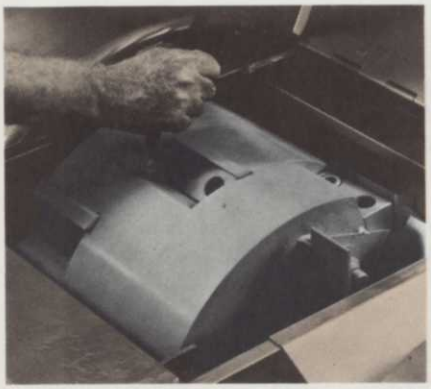
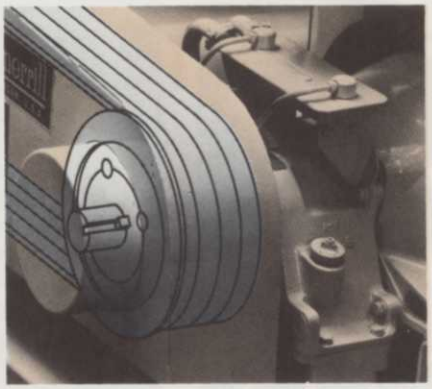


Staggered knife pattern, for years a Mitts & Merrill feature, has always resulted in a lower noise level. First, by segmenting the noise source. Second, through smoother cutting action. Third, by producing smaller chips.



Optional torque converters and the heaviest steel cylinder — even without an external flywheel — combine to give positive cutting action under the most rugged conditions. Isolates the engine from shock. Minimizes maintenance.

Plus • **Positive safety-lock pin** for greater operator safety • **Swing-away, folding feed chute** protects cutting chamber; allows instant access and increases maneuverability • **Heavy duty construction** includes coil spring, torsion-type suspension, and box tubular steel frame.

mitts & merrill — SUBSIDIARY walco WALCO NATIONAL CORPORATION

Dept. WTT 52, 109 McCoskry St., Saginaw, Michigan 48601

Circle 109 on free information card

SUPERTRAPP, a new line of muffler/spark arrestors for almost all types of power equipment, is being

introduced by Discojet Corporation. Factory tests have shown that it averages less than half the noise level of competing mufflers and spark arrestors without sacrificing performance, according to Discojet. Supertrapp is USDA Forest Service Approved at 99.4 percent spark arresting efficiency and is multi-position rated. It offers rain protection in vertical mounting so that no flapper cap is required.

Supertrapp's patented "diffuser disc" design uses a stack of contoured discs to both dissipate and difuse the noise. The number of discs used can be varied to accommodate engine size and silencing requirements. Because of this, only three basic modes are needed to meet all applications from two to 200-hp.

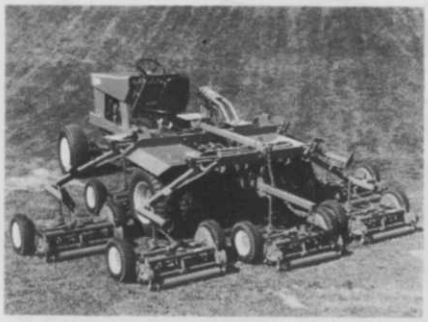
Model 2S is designed for gasoline engines up to eight horsepower, where minimum space is available. Model 3S is for gasoline and diesel engines from two to 70-hp. Model 5S can be fitted to gasoline and diesel engines in the 18 to 200-hp range.

Circle 704 on free information card

HYDRA-CUB SPREADER by Koehring Co. is a hydraulically-powered spreader with capability to spread sand, salt, seed, fertilizer or other materials in widths up to 40 ft. The hydraulic system requires only a small PTO or electric pump for operation. A single control valve provides control from the driver's seat. The Hydra-Cub holds nearly two cu. yds. of material. It mounts on pick-up beds of seven ft., and on flat-bed and dump trucks. It is constructed of 12-gauge steel and weighs 700 lbs.

Circle 706 on free information card

WOODSMAN CLEARING machines by Royer Foundry & Machine Co., cuts a five foot swath through dense trees and brush. It can clear up to three acres per day and trees up to six inches in diameter. The Woodsman leaves a mulch blanket over cut areas, eliminating the need for hauling or burning. The cutting rotor casts chips forward and downward, not to the side, enabling use near



DIESEL PARKMASTER by Toro combines the benefits of diesel power and multiple reels for fast and reliable cutting. Reel gangs are raised hydraulically for easy transport. Five, seven, or nine reel units are available for cutting swaths from 30 in. to 18 ft. wide. Light kits, roll bars, and cabs are available of the Parkmaster. The diesel power source is made by Perkins. It has a four-cylinder, 236 CID engine with 16:1 compression ratio.

Circle 705 on free information card

Conwed® Hydro Mulch® 2000. It's in the bag.

Hydro Mulch® 2000 is a ready-mixed tackifier and mulch in one bag. That simplifies storage and helps eliminate loading errors. Application is fast and easy. Hydro Mulch 2000 fibers cut post job maintenance costs and provide protection against costly repairs and redo's. The special tackifier helps hold down the fiber mulch, seed and fertilizer while it protects against wind and water erosion. The fiber mulch holds water and stabilizes temperature variances for fast seed germination and strong plant starts. A temporary green dye permits monitoring of application and gives the job a finished look.

Write for informative brochure. Conwed Corporation, Environmental Products Division, 332 Minnesota St., P.O. Box 43237, St. Paul, Minnesota 55164. Phone: (612) 221-1144.

Conwed®

innovative products for better environments

Circle 154 on free information card

highways or buildings. The diesel-powered unit is available in models for mounting on loaders and dozers, PTO-powered for tractors, and a unit for mounting on Mercedes-Benz Unimog. Tractors over 80 hp can operate the Woodsman.

Circle 707 on free information card

SOIL TESTER Model 697-A, from Hellige, provides tests for 14 chemical soil elements. Reagents and all necessary equipment are provided for making phosphorus, potassium, pH, calcium, magnesium, chlorides, nitrate and nitrite nitrogen, ammonia sulfates, aluminum, humus, manganese, ferric iron and plant tissue tests. Full instructions are also given for correcting improper soil conditions.

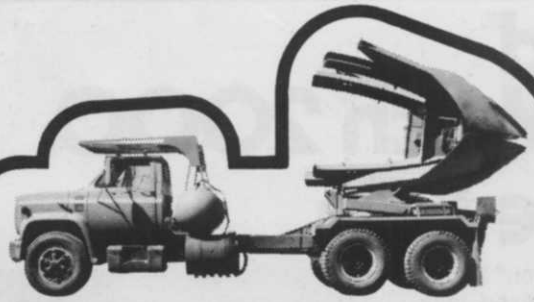
Guaranteed-permanent, non-fading glass color standards are included for accurate results. The tough water-resistant case contains all the supplies. Reagents are stable for a year or more.

Circle 708 on free information card

ELMPRO, an injectable systemic fungicide containing Arbotect, is now available from Hopkins Agricultural Chemical Company, for combatting Dutch elm disease. Mixed 1:1 with water and injected into the vascular system of an elm tree, Elmpro translocates throughout the tree with evidence of downward movement, as well as movement into new wood. Elmpro is said to be highly effective as a preventative treatment for healthy elm trees, and as a therapeutic treatment when elm trees show less than five percent crown damage due to Dutch elm disease.

Advantages claimed for Elmpro include: once-per-season treatment; excellent residual of Elmpro in the tree to protect against late season infections by second broad bark beetles; and low volume of injection solution required per tree. Elmpro is injected either by gravity or low pressure injection equipment.

Circle 709 on free information card



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BUNTON.

The Bunton Breed

Introducing the 36 inch cut Bunton Rear Discharge mower. A new design deck allows close trimming on both sides, helps prevent windrows and gives you a clean manicured cut (not that just-cut look). The new variable speed drive gives a wider range of ground speeds. The 3 gallon fuel tank and Hi-Way front caster wheels are standard equipment. This new mower is designed for fine lawns and rough areas. The finger tip control gives the same easy handling and hillside stability and maneuverability as the other Bunton Self-Propelled models. Also available is a new 52 inch rear discharge mower.

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Phone 502/459-3810 Telex 204-340

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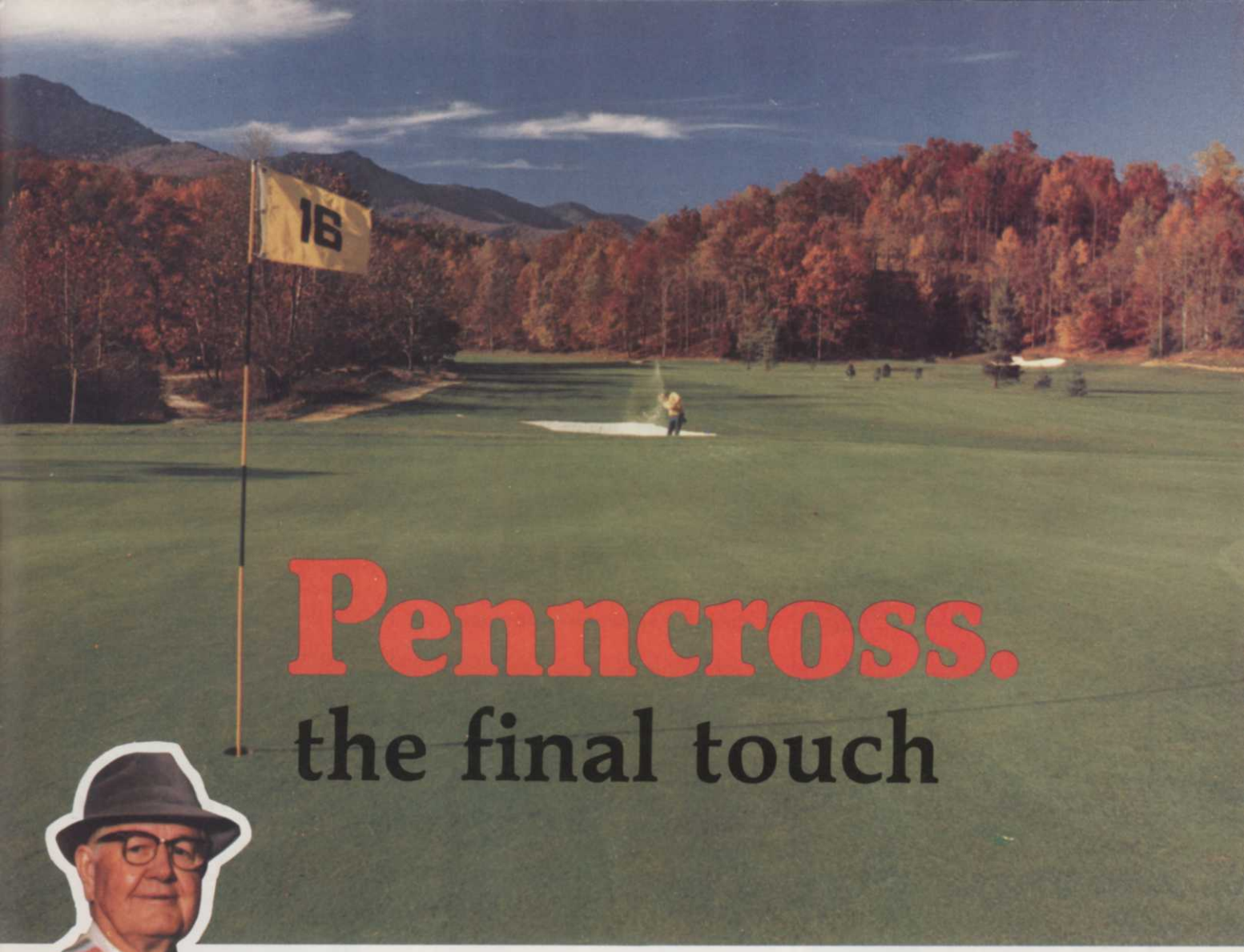

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BYRON NELSON

Mr. Golf, Byron Nelson on Penncross: "Over the years golf course people have tried many types of grasses for greens. In the last ten years, many of the championship courses have produced near perfect putting greens. In my estimation, this is because of the development and wide spread use of Penncross Bentgrass. With good maintenance, it provides a uniform putting surface that putts true and has good color."

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It takes a great deal of time and money to build a golf green. Irrigation, drainage and contour are some of the considerations of a great putting surface. The final touch is the type of grass selected for that putting surface. Penncross Creeping Bentgrass is recognized around the world as a superior grass for golf course use. Penncross is more genetically uniform, disease resistant and it establishes quicker than conventional bents. From Palm Desert, California to Anchorage, Alaska, Penncross has proven its climatic adaptability. For that final touch to a great golf green, look to Penncross!

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Series 9200 Hypro pedestal centrifugals offer capacities to 130 gpm, handle pressures to 170 psi and speeds to 6000 rpm. Compact, engine driven model features space-saving side-by-side mounting.

Choose gear or hydraulic drive.

Hypro Series 9000 gear-driven centrifugals mount directly on 1⅜ inch PTO shafts.

Hypro Series HM9200 centrifugals come complete with hydraulic motor.

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Circle 110 on free information card

REACH-ALL MODEL HD5150 has a 150-ft. nominal working height, 46-ft. side reach and a two-man fiberglass basket with 600-lb. capacity. It is equipped with four double-acting hydraulic cylinders to lift the lower boom providing two cylinders in compression at all times. The upper boom is equipped with two double-acting cylinders, providing one cylinder in compression at all times.

The lower boom, fully telescoped, can be placed in vertical configurations within the limits of 84-88 deg. and the upper boom is capable of 136 deg. articulation. Model HD5150 has been tested and certified for bare hand work on lines carrying 765 KV and withstood switching surge tests up to 1,560 KV.

Circle 710 on free information card

NEW TANDEM FRAME for tractors, produced by Herder B.V. of Middelburg, the Netherlands, facilitates mowing and cleaning ditches, with such accessories as mower arms, rakes, grass collectors, clapper mowers, disc mowers, and dredging and excavating buckets. The frame makes it possible to interchange the implements and adapt them to the tractor's hydraulic system without difficulty, according to Herder B.V.

The frame is mounted on four wheels and the arm can be rotated through an angle of 120 degrees. The hydraulic system is located on the tandem frame and is controlled by cables from the tractor.

Circle 711 on free information card

"NARROW PACKAGE" for skid-steer loader models is available from Sperry New Holland. The package, which features a 47-inch wide utility bucket, is available on their 22 hp model L-325 and 30 hp models L-425 and L-445. The new configuration, reducing bucket width by seven inches, is designed to permit loader use in and around buildings with narrow aisles, passageways or doorways. It also permits transporting the loader in a pickup truck.

The package includes 5.70-15 chevron-tread tires and wheels and redesign of the boom hose fittings to conform to the new configuration. Operating loads (SAE) are unchanged for the three models — 900 lbs. for the L-325, and 1,000 lbs. for the L-425 and L-445.

Circle 712 on free information card

Vandermolen has developed a new heavy duty model DIADEM Brush Chipper powered by a 16 HP Kohler engine. This new chipper features heavy duty bearings that are 33% stronger than the lower HP units. A double V belt drives the unique DIADEM rotor.

The DIADEM Chipper offers a rotor design similar to those used in large tow-behind chippers. The solid rotor has two cutting knives almost ½" thick that slice through clumps of brush in a matter of just a few seconds.

The units are avilable on fully pneumatic wheels or as skid units. The wheeled model is very maneuverable because of its small 32" wheel base.

Circle 713 on free information card

For football fields and/or shady glens Glade Kentucky bluegrass is the seed to specify for excellent performance. In full sun or cool shade (up to 60%) you can depend on Glade to germinate quickly, establish fast. Forms a thick rhizome and root system, dense, low-growing, fine-textured turf of medium to deep green in color.

Glade Kentucky bluegrass has proven resistance to many troublesome diseases including stripe smut and leaf rust. Better than average resistance to today's Fusarium blight has made Glade a vital fortifying ingredient in many professional turf grass mixtures. A higher level of resistance to powdery mildew in moderate shade.

A Rutgers University selection (tested as P-29), Glade Kentucky bluegrass is your guarantee of physically pure and genetically true seed.

Specify the sun-n-shade elite Glade Kentucky bluegrass seed for your next lawn seed mix, available at your local wholesale seed distributor.

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Another fine, quality-controlled product of Jacklin Seed Company.

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When answering ads where box number only is given, please address as follows: Box number, c/o Weeds Trees and Turf, Dorothy Lowe, Box 6951, Cleveland, Ohio 44101.

Rates: All classifications 65¢ per word. Box number, $1. All classified ads must be received by Publisher the 5th of the month preceding publication date and be accompanied by cash or money order covering full payment. Mail ad copy to: Dorothy Lowe, Weeds, Trees & Turf, P.O. Box 6951, Cleveland, Ohio 44101.

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AERIAL BASKETS, digger-derricks, stump cutter, brush chipper and Prentice loader. 414 354-8730. Allied Enterprises, 9102 N. 75th St., Milwaukee, Wisc. 53223.

PENNCROSS SOD, mowed 3/16", .10 per square foot. Farm Golf Club, Morrisville, Vermont 05661. (802) 888-3525.

CHEMICAL LAWN SERVICE in southeastern area. Will top $450,000 volumn in 1978. Excellent reputation established. Five application program. Inquiries Box 198, Weeds, Trees & Turf, Box 6951, Cleveland, Ohio 44101.

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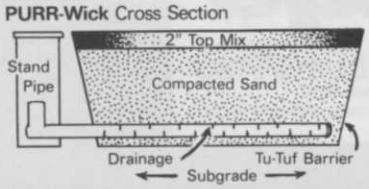

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USED EQUIPMENT

2 — 50' AERIAL BASKETS, brush chipper, stump cutter, 2 sprayers, small crane. Parkway Tree Service, 12026 West Cherry St., Wauwatosa, Wisconsin 53226. 414 257-1555.

FOR SALE; Used tree service equipment, stump cutters, brush chipper, aerial basket unit. Lappe Tree Service Equipment, 1226 South Broadway, New Ulm, Mn. 56073. 507 359-2713.

USED CHIPPERS, skyworkers, Arlo cranes and hydro-ax's. Please call P. C. Gould Sales Company, Box 178, Essex, Conn. 06426. 203 767-1636, Phil or Jeff Gould.

1973 C65 CHEVROLET with 50' working height bucket, fiberglass upper boom, 4 cylinder Wisconsin engine and compressor, utility body. $14,500.00. Picture on request. Livonia, New York. 716 346-3981.

NATIONAL 84" Tri-Plex mower, used 2 seasons on 3 acre residential lawn, like new, $1,500.00. Call 201 453-3205 (N.J.)

FOR SALE: Two (1975, 52 ft.) Hi-Rangers, mounted on Ford F-700, complete with hydraulic tools, $32,000 each; two chip/dump trucks, $5,000 each; two chippers. 206 325-1529.

FOR SALE: Roseman pull type 7 gang hydra gang mower. Model HGP-7. Excellent condition. $4,500.00. Emerald Turfgrass Farms, Inc., Sumner, Washington 98390. 206 863-1261.

FOR SALE: Vermeer model 6 stump cutter, completely reconditioned, $3,500 cash. Green Giant Tree Service 714 292-4641, San Diego, Calif.

TREE SERVICE EQUIPMENT — 4 chippers, 4 aerial bucket trucks, 2 crew trucks. John Mayer, 300 Muir Mill Road, Willits, Calif. 95490. Phone 707 459-2013.

35' SKY WORKER, $4,500, 12" Asplundh brush chipper, 1967 Chev. chipper truck, $3,500. All in good condition. 414 231-5025 after 4:00 P.M.

MISCELLANEOUS

WE DIG TREES. Will move large trees (5" to 10") with 78" tree spade. Will travel. Call or write Floral City Tree Service, 891 N. Dixie Hwy., Monroe, Michigan 48161. 313 241-7510.

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LEARN LANDSCAPING and the Growing of Plants at home. Start a satisfying business or hobby. Free booklet. Lifetime Career Schools, Dept. A-401, 2251 Barry Avenue, Los Angeles, Ca. 90064.

WANTED TO BUY

WANTED TO BUY: Used Ryan sod cutter with riding roller. Please call 317 266-6198.

AAA TREE SERVICE, INC. is interested in buying all types of used tree equipment. 1292 South Eastlake, Longwood, Florida 32750. Phone 305 339-5242.

WILSON TREE SERVICE — buys all types tree equipment. 1014 Big Cove Road, Huntsville, Ala. 35801.

HELP WANTED

BRANCH MANAGER — National automated lawn service presently in franchise market seeks experienced individual to start and head up company areas. Tremendous growth potential for one presently with liquid spray management experience. Send confidential resume to Lawn Doctor, Inc., P.O. Box 525, 142 Highway 34, Matawan, New Jersey 07747.

SEEDS

SOD QUALITY Seeds: Adelphi, Glade, Cheri, Nugget, Merion, Fylking, Majestic, Baron & Touchdown bluegrasses, also fine fescues. Manhattan ryegrass. Custom mixing available. Michigan State Seed, Grand Ledge, Michigan 48837. Phone 517 627-2164.

LAWN SEED. Wholesale. Full line of top quality grasses. Improved bluegrass varieties, fine fescues and fine bladed ryegrasses. We specialize in custom mixing. Oliger Seed Company, 2705 Wingate Avenue, Akron, Ohio 44114. Call collect. 216 753-2259.

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DURSBAN* Insecticide Will Treat 1000 Square Feet of Turf for Around Half a Buck.

That's less money than most other turf insecticides. In most cases, a lot less. And it lasts a lot longer, too.

So if you have a lot of area to cover, go with the proven performance of DURSBAN* 2E Insecticide and the double-strength formulation DURSBAN 4E Insecticide. They're the effective, economical way to do away with common turf pests.

You see, DURSBAN Insecticides are carefully formulated to provide broad spectrum, multi-purpose control of cutworms, chinchbugs, sod webworms and numerous other turf pests, plus ornamental plant pests and mosquitos. They kill turf pests two ways: by contact and ingestion.

And DURSBAN Insecticides give unsurpassed residual control of all surface turf insects. Which means they work longer. And that saves you time, saves you trips. And that's money to you.

Add up the benefits and you'll see why the pros in the industry choose DURSBAN 2E and double-strength DURSBAN 4E Insecticides two-to-one over the nearest competitor.

Make DURSBAN Insecticides part of your turf program. Just be sure to read and follow all label directions and precautions. Agricultural Products Department, Midland, MI 48640.

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WT&T

EVENTS

Missouri Turf Field Day, University of Missouri South Farms, Columbia, Mo., **July 25.** Call: 314/882-7838.

1978 Penn Allied Nursery Trade Show, Hershey Motor Lodge and Convention Center, Hershey, Pa., **July 25-27.** Call: 717/243-1786.

University of Massachusetts Turfgrass Field Day, University Farm, South Deerfield, Mass. **July 26.** Call: 413/545-2353.

Municipal and Community Street Tree Conference, Ohio Agricultural Research and Development Center, Wooster, Ohio, **Jul. 27.** Contact: Fred K. Buscher, Area Extension Center, OARDC, Wooster, Ohio, 44691.

Western States Tree Trimmers Jamboree, Templeton Park, Templeton, Calif., **Jul. 29.** Contact: Tree Trimmers Jamboree, Recreation and Parks Department, 110 East Cook St., Santa Maria, Calif., 93454.

The South Carolina Plant Food Educational Society Annual Summer Meeting, Holiday Inn, Hilton Head, S.C., **July 30-Aug. 1.** Contact: A. B. Everett, Sec.-Treas., TSCPFES, 615 Saluda Ave., Columbia, S.C., 29205.

Third Nebraska Turfgrass Field Day and Equipment Show, Turfgrass Research Facility, University of Nebraska Field Lab, Mead, Neb., **Aug. 1.** Contact: Dr. R. C. Shearman, Turfgrass Specialist, 105 Plant Industry Bldg., University of Nebraska, Lincoln, Neb., 68583.

Illinois Landscape Contractors Association Annual Summer Field Day, Stonegate Farm Nursery, Poplar Grove, Ill., **Aug. 2.** Call: 312/894-4774.

ALCA Erosion Control/Revegetation Symposium, Marriott Hotel, Denver, Colo., **Aug. 3-4.** Call: 703/893-5400.

Ohio Nurserymen's Association Annual Summer Meeting, Stouffer's Dayton Plaza Hotel, Dayton, Ohio. **Aug. 8-10.** Contact: Ohio Nurserymen's Association, 6075 Cleveland Ave., Columbus, Ohio, 43229.

American Association of Nurserymen 1978 Management Seminar, Colorado State University, Fort Collins, Colo., **Aug. 13-18.** Call: 202/737-4060.

54th Annual Convention of the International Society of Arboriculture, Sheraton Centre Hotel, Toronto, Ontario, Canada, **Aug. 13-17.** Call: 217/328-2032.

Lawn, Garden, Outdoor Living Show, Division of National Hardware Show, McCormick Place, Chicago, Ill., **Aug. 14-17.** Call: 212/682-4802.

Tenth Biennial National Christmas Tree Convention, Amherst, Mass. **August 16-18.** Contact: National Christmas Tree Assoc., 611 E. Wells St., Milwaukee, Wisc. 53202.

Penn State Turfgrass Field Days, Joseph Valentine Turfgrass Research Center, Pennsylvania State University, University Park, Pa., **Aug. 16-17.** Contact: Dr. Joseph Duich, 21 Tyson Bldg., Dept. of Agronomy, University Park, Pa., 16802.

Central Plains Turfgrass Association/Kansas State University Field Day, Kansas State University, Manhattan, Kan., **Aug. 23.** Call: 913/532-6170.

47th Annual Turfgrass Field Day, University of Rhode Island Turfgrass Research Farm, Kingston, R.I., **Aug. 23.** Contact: Professor C. R. Skogley, Plant and Soil Science Dept., University of Rhode Island, Kingston, R.I., 02881.

11th Annual Nursery-Equipment Field Day, Lake County Nursery Exchange, Perry, Ohio, **Aug. 24.** Contact: Fred K. Buscher, Area Extension Agent, Horticulture, Area Extension Center O.A.R.D.C., Wooster, Ohio, 44691.

Ornamentals Northwest Short Course, Portland Memorial Coliseum, Portland, Oregon, **Aug. 25-26.** Contact: Jim Green, Horticulture Dept., Oregon State University, Carvallis, Oregon, 97331.

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